SOIL SURVEY OF

Marshall County, Mississippi

U. S. Department of Agriculture
Soil Conservation Service and Forest Service
In cooperation with
Mississippi Agricultural Experiment Station

Issued July 1972

Major fieldwork for this soil survey was done in the period 1959-68. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1968. This survey was made cooperatively by the Soil Conservation Service and Forest Service, and the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished to the Marshall County Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, pasture, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Marshall County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the woodland groups.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Town and Country Planning."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Marshall County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication.

Cover Picture

Cattle grazing pasture of rye, oats, and crimson clover.

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SOIL SURVEY OF MARSHALL COUNTY, MISSISSIPPI

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND FOREST SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

MARSHALL COUNTY, in the north-central part of Mississippi, has an area of 443,520 acres or 693 square miles (fig. 1).

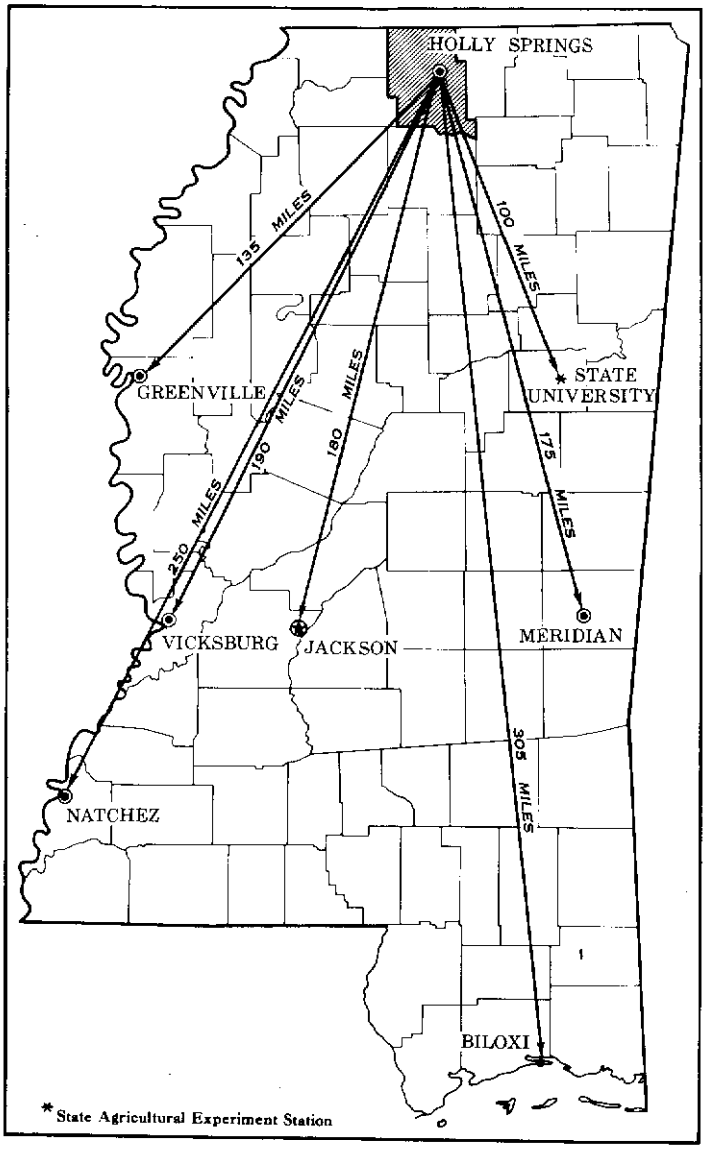

Figure 1.--Location of Marshall County in Mississippi.

The major towns in the county are Holly Springs, Byhalia, and Potts Camp. The North Mississippi Branch Agricultural Experiment Station is located at Holly Springs. Distances from Holly Springs, the county seat, to major towns in the State are shown in figure 1.

Much of the county is hilly. The landscape is especially rugged through the central, eastern, and northeastern parts of the county. The highest ridges have an elevation of 700 feet.

Most areas are drained by tributaries of the Yazoo River, but about 70 square miles in the northeastern corner of the county is drained by tributaries of the Wolf River in Tennessee.

About 47 percent of the county is woodland. Loblolly and shortleaf pines are dominant on uplands and hardwoods on bottom lands. Many acres of eroded soils formerly used for cultivated crops have been reforested. The woodland provides habitat for deer, turkeys, and other forest game, and is an important economic resource for several companies in the county.

All parts of the county provide habitat suitable for wildlife. Farm game, mainly bobwhite, doves, and rabbits, live in open areas where part of the acreage is cultivated. Forest game, mainly deer, squirrels, and turkeys, live in wooded areas where the stands are partly hardwoods. Waterfowl live near water and marshes.

The economy is based mainly on cotton and livestock farming. Truck crops are grown where adequate labor is available. The number of farms is decreasing but the size is increasing.

A number of industries in Holly Springs manufacture brick and tile, electronic components, sanding and polishing products, metal cabinets for refrigerators, and components for pianos and other musical instruments.

Two major railroads and three main highways traverse the county. Proximity to Memphis, Tennessee, and easy access to all parts of the county by road have contributed to the increasing demand for recreational facilities and vacation housing in Marshall County. Nonfarm uses of the soils are discussed in the section "Town and Country Planning."

HOW THIS SURVEY WAS MADE

Soil scientists made this survey to learn what kinds of soil are in Marshall County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots (9) 1/.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The soil series and the soil phase are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Lexington and Memphis, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Memphis silt loam, 2 to 5 percent slopes, eroded, is one of several phases within the Memphis series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Three such kinds of mapping units are shown on the soil map of Marshall County: soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Providence-Cahaba complex, 12 to 30 percent slopes, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Arkabutla-Rosebloom association is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded, is an example.

In most areas surveyed there are places where the soil material is so rocky, so wet, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Swamp is a land type in Marshall County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of

1/ Underlined numbers in parentheses refer to Literature Cited, p. 66.

soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland and rangeland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

GENERAL SOIL MAP

The general soil map at the back of this survey shows, in color, the soil associations in Marshall County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in Marshall County are described in the following pages.

1. Arkabutla-Rosebloom Association

Nearly level, somewhat poorly drained and poorly drained soils; on flood plains

This association occurs on flood plains along the Tallahatchie and Tippah Rivers in the southeastern part of the county. In places the flood plains are more than 2 miles wide. Slopes are 2 percent or less.

This association makes up about 5 percent of the county. It is about 60 percent Arkabutla soils and 11 percent Rosebloom soils. The rest is mainly Cascilla, Collins, and Vicksburg soils and areas of Swamp along old stream channels. The Arkabutla and Rosebloom soils are at low elevations in areas generally some distance from old stream channels.

Arkabutla soils are nearer the old stream channels than the Rosebloom and are somewhat poorly drained. The surface layer is dark-brown silt loam about 6 inches thick. The upper part of the subsoil is dark-brown silt loam mottled with light brownish gray. The lower part is light brownish-gray and gray silty clay loam.

Rosebloom soils are in the most depressed areas and are poorly drained. The surface layer is dark grayish-brown silt loam about 4 inches thick. The upper 4 inches of the subsoil is mottled light brownish-gray, pale-brown, and brown silty clay loam. Below this is light brownish-gray and gray silty clay loam mottled with yellowish brown.

This association is frequently flooded. Most of the acreage is owned by the Corps of Engineers, U.S. Army, and is used as a floodwater retention area for the Sardis Reservoir. The streams and woods provide excellent fishing and hunting. The game is mainly duck, deer, and squirrel.

2. Collins-Vicksburg-Falaya Association

Nearly level, well-drained to somewhat poorly drained soils; on flood plains

This association occurs on flood plains throughout the county. Slopes are 2 percent or less.

This association makes up about 11 percent of the county. It is about 50 percent Collins soils, 20 percent Vicksburg soils, and 20 percent Falaya soils. The rest is mainly the well-drained Cascilla and Ochlockonee soils.

Collins soils are moderately well drained. The surface layer is brown silt loam about 6 inches thick. Below this is yellowish-brown silt loam, about 16 inches thick, that is mottled with light gray. This is underlain by silt loam mottled with shades of brown and gray.

Vicksburg soils are well drained. The surface layer is dark yellowish-brown silt loam about 6 inches thick. Below this is dark yellowish-brown, brown, and dark-brown silt loam.

Falaya soils are somewhat poorly drained. The surface layer is dark-brown silt loam about 7 inches thick. The upper part of the subsoil is dark-brown silt loam mottled with light brownish gray. The rest is grayish silt loam mottled with shades of brown.

This association is well suited to row crops, pasture, and trees. Suitable crops are cotton, corn, soybeans, small grains, and pasture plants. Occasional flooding is a limitation for residential and industrial uses. Areas so used should be drained and protected from floods.

3. Luverne-Susquehanna Association

Moderately steep, well-drained and somewhat poorly drained soils; on narrow ridgetops and side slopes

This association is in the southeastern part of the county. The dominant soils occur on narrow ridgetops and moderately steep side slopes. Many small streams and draws traverse the area. Slopes range from 12 to 30 percent.

This association makes up about 2 percent of the county. It is about 55 percent Luverne soils and 35 percent Susquehanna soils. The rest is mainly Providence and Cahaba soils on uplands and Arkabutla and Ochlockonee soils on flood plains.

Luverne soils generally are on ridgetops and the upper part of side slopes. They are well drained. The surface layer is loam, about 2 inches thick, that has mixed colors of brown. Below this is sandy clay loam, about 2 inches thick, that is mottled with shades of red and brown. The subsoil is yellowish-red silty clay and silty clay loam. The underlying material is stratified loam and silty clay loam that has shades of brown, red, and gray.

Susquehanna soils are on the lower part of side slopes and are somewhat poorly drained. The surface layer is mixed brown and very dark grayish-brown silt loam about 2 inches thick. Below this is yellowish-brown silty clay loam about 4 inches thick. The upper part of the subsoil is strong-brown to red silty clay and clay mottled with gray. The lower part is clay mottled with shades of gray, brown, and red.

This association is suited to timber and permanent pasture. Most of the acreage is in hardwood forest, but some areas have been cleared for pasture. Hunting deer and squirrel is a popular sport in this association. Moderately steep slopes and the shrink-swell potential of the soils are limitations for residential and industrial uses.

4. Gullied Land-Cahaba-Lexington Association

Gullied land and gently sloping to steep, well-drained soils; on ridgetops and side slopes

This association is in the eastern and southern parts of the county. The dominant soils occur on ridgetops and side slopes. Some areas on steep side slopes are wooded, but many have been cleared and are gullied. In recent years, pine trees have been planted in many of these gullies (pl. I, top).

This association makes up about 24 percent of the county. It is about 30 percent Gullied land, 25 percent Cahaba soils, and 20 percent Lexington soils. The rest is mainly Cascilla, Collins, Falaya, and Vicksburg soils on flood plains.

Gullied land is so eroded that only small areas of the original soil remain between the gullies.

Cahaba soils generally are on the lower part of side slopes. The surface layer is dark-brown loam about 1 inch thick. Below this is yellowish-brown loam about 6 inches thick. The subsoil is reddish-brown to red sandy clay loam that extends to a depth of 34 inches. The substratum is red sandy loam.

Lexington soils are on ridgetops and the upper part of side slopes. The surface layer is brown silt loam about 5 inches thick. The subsoil is brown and dark yellowish-brown silty clay loam to silt loam; it extends to a depth of about 48 inches. Below this is reddish-brown sandy loam.

The Cahaba and Lexington soils in this association are suited to row crops, pasture, and trees. Suitable crops are cotton, corn, soybeans, small grains, and pasture plants. Gullied land is suited only to pine trees.

5. Loring-Gullied Land Association

Gullied land and gently sloping to moderately steep, moderately well drained soils that have a fragipan; on ridgetops and side slopes

This association is mainly in the central part of the county. The dominant soils occur on broad ridgetops and side slopes. Slopes range from 2 to 30 percent.

This association makes up about 48 percent of the county. It is about 30 percent Loring soils and 20 percent Gullied land. The rest is mainly well-drained Cahaba and Memphis soils, moderately well drained Providence soils, and somewhat poorly drained Calloway soils. Collins, Falaya, and Ochlockonee soils occur on flood plains.

Loring soils are on the ridgetops and the upper part of side slopes. Their surface layer is dark yellowish-brown silt loam about 5 inches thick. The upper part of the subsoil is strong-brown and dark-brown silty clay loam that extends to a depth of about 26 inches. The lower part is a dark-brown silt loam fragipan that is mottled with shades of gray, brown, and red.

Gullied land is so eroded that only small areas of the original soil remain between the gullies.

Loring soils are suited to row crops, pasture, and trees. Suitable crops are cotton, corn, soybeans, small grains, and pasture plants. Soils on ridgetops, flood plains, and hillsides are used for crops and pasture. Areas of Gullied land are mostly wooded.

6. Loring-Grenada Association

Nearly level to sloping, moderately well drained soils that have a fragipan; on broad ridgetops

This association is in the northern and northwestern parts of the county. The dominant soils occur on broad ridgetops and side slopes. Slopes range from 0 to 12 percent.

This association makes up about 10 percent of the county. It is about 50 percent Loring soils and 14 percent Grenada soils. The rest is mainly

moderately well drained Providence soils, somewhat poorly drained Calloway soils, and poorly drained Henry soils on uplands. Cascilla, Collins, Falaya, and Vicksburg soils occur on flood plains.

Loring soils have a dark yellowish-brown silt loam surface layer about 5 inches thick. The upper part of the subsoil is strong-brown and dark-brown silty clay loam that extends to a depth of about 26 inches. The lower part is a silt loam fragipan that is brown mottled with shades of gray, brown, or red.

Grenada soils have a mottled brown and dark-brown silt loam surface layer about 5 inches thick. The upper part of the subsoil, extending to a depth of about 23 inches, is dark yellowish-brown or yellowish-brown silt loam mottled with light brownish gray. Mottled grayish and brownish silt loam extends to a depth of about 33 inches. Below this is a mottled dark-brown and light brownish-gray silt loam fragipan that is compact and brittle.

This association is suited to row crops, pasture, and trees. Most of the acreage is used for cultivated crops and pasture. Suitable crops are cotton, corn, soybeans, small grains, and pasture plants.

DESCRIPTIONS OF THE SOILS

This section describes the soil series and the mapping units in Marshall County. The procedure is first to describe each soil series, and then the mapping units in that series. The description of each mapping unit contains suggestions on how the soils can be used and managed. Thus, to get full information on any one mapping unit, it is necessary to read both the description of that unit and description of the soil series to which it belongs.

Each soil series contains two descriptions of a soil profile. The first is brief and in terms familar to a layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Swamp, for example, does not belong to a series but, nevertheless, is listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland group in which the mapping unit has been placed. The system of capability classification is explained in the section "Capability Grouping," and the section "Woodland" describes the woodland of the county.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey.

TABLE 1.--APPROXIMATE ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Soil	Area	Extent	Soil	Area	Extent
	Acres	Percent		Acres	Percent
Arkabutla silt loam	8,951	2.0	Loring silt loam, 8 to 12 percent slopes, severely eroded	3,710	0.8
Arkabutla-Rosebloom association	7,960	1.8	Luverne complex, 12 to 30 percent slopes, severely eroded	2,370	.5
Cahaba and Lexington soils, 12 to 30 percent slopes	22,739	5.1	Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded	1,595	.4
Cahaba-Lexington association, hilly	5,845	1.3	Luverne-Susquehanna association, hilly	8,787	2.0
Cahaba-Providence complex, 12 to 30 percent slopes, severely eroded	22,399	5.1	Memphis silt loam, 0 to 2 percent slopes	204	(1/)
Calloway silt loam, 0 to 2 percent slopes	491	.1	Memphis silt loam, 2 to 5 percent slopes, eroded	10,806	2.4
Calloway silt loam, 2 to 5 percent slopes, eroded	8,890	2.0	Memphis silt loam, 5 to 8 percent slopes, severely eroded	2,574	.6
Cascilla silt loam	8,706	2.0	Ochlockonee sandy loam	3,578	.8
Collins silt loam	22,642	5.1	Providence silt loam, 2 to 5 percent slopes, eroded	2,700	.6
Collins-Arkabutla-Bruno association	3,430	.8	Providence silt loam, 5 to 8 percent slopes, severely eroded	1,013	.2
Collins-Arkabutla-Falaya association	4,964	1.1	Providence silt loam, 8 to 12 percent slopes, severely eroded	8,503	1.9
Falaya silt loam	16,960	3.8	Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	448	.1
Grenada silt loam, 0 to 2 percent slopes	286	.1	Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	520	.1
Grenada silt loam, 2 to 5 percent slopes, eroded	4,763	1.1	Providence silt loam, heavy substratum, 8 to 12 percent slopes, severely eroded	761	.2
Grenada silt loam, 5 to 8 percent slopes, severely eroded	1,380	.3	Providence-Cahaba complex, 12 to 30 percent slopes	12,088	2.7
Gullied land-Cahaba complex, 5 to 30 percent slopes	55,404	12.5	Providence-Cahaba association, hilly	17,249	3.9
Gullied land-Loring complex, 5 to 30 percent slopes	60,948	13.7	Swamp	2,048	.5
Henry silt loam	3,503	.8	Vicksburg silt loam	6,573	1.5
Lexington silt loam, 2 to 5 percent slopes, eroded	3,716	.8	Vicksburg and Ochlockonee soils	6,595	1.5
Lexington silt loam, 5 to 8 percent slopes, severely eroded	4,419	1.0			
Lexington silt loam, 8 to 12 percent slopes, severely eroded	4,303	1.0			
Loring silt loam, 2 to 5 percent slopes, eroded	53,215	12.0			
Loring silt loam, 5 to 8 percent slopes, severely eroded	25,484	5.8	Total	443,520	100.0

1/ Less than 0.1 percent.

Arkabutla Series

The Arkabutla series consists of somewhat poorly drained soils on flood plains.

Typically, the surface layer is dark-brown silt loam about 6 inches thick. The subsoil extends to a depth of 50 inches. It is mainly dark-brown silt loam mottled with light brownish gray in the upper 9 inches, and light brownish-gray and gray silty clay loam below.

Representative profile of Arkabutla silt loam, in a soybean field, 5 miles southwest of Potts Camp, 990 feet west of county road, SW1/4 SE1/4 NW1/4 sec. 12, T. 6 S., R. 2 W.:

Ap--0 to 6 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

B1--6 to 15 inches, dark-brown (10YR 4/3) silt loam; few, fine, distinct, light brownish-gray mottles; weak, medium, subangular blocky structure; very friable; many fine pores; strongly acid; gradual, wavy boundary.

B21--15 to 19 inches, mottled dark yellowish-brown (10YR 4/3) and grayish-brown (10YR 5/2) silt loam; weak, medium, subangular blocky structure; friable; few, fine and medium, black and brown concretions; many fine pores; strongly acid; gradual, wavy boundary.

B22g--19 to 38 inches, light brownish-gray (10YR 6/2) silty clay loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; friable; few, fine and medium, black and brown concretions; many fine pores; very strongly acid; gradual, wavy boundary.

B23g--38 to 50 inches, gray (10YR 6/1) silty clay loam; common, medium to coarse, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; firm; few, fine and medium, black and brown concretions; very strongly acid.

The Ap horizon is dark brown to brown. Where present, the A1 horizon is thin and ranges from very dark grayish brown to grayish brown. The B1 horizon is silt loam to silty clay loam. It is dark brown, brown, or yellowish brown and has light brownish-gray mottles. The B21 horizon ranges from silt loam to silty clay loam that is mottled with shades of brown, yellow, or gray; the matrix is dark gray to light brownish gray. The B22 and B23 horizons are grayish silt loam to silty clay loam mottled with brown and yellowish brown. Reaction is strongly acid to very strongly acid in all layers, except where the soils have been limed.

Arkabutla soils are associated with Bruno, Cascilla, Collins, Falaya, Rosebloom, and Vicksburg soils. They are finer textured and more poorly drained than the excessively drained, sandy Bruno soils. They have grayer colors in the B horizons than the well-drained Cascilla soils. They have poorer drainage and finer texture than Collins and Vicksburg soils, neither of which have a B horizon. They are similar to Falaya soils in drainage, but they have a more clayey B horizon. They are browner than the poorly drained Rosebloom soils.

Arkabutla silt loam (Au).--This is a somewhat poorly drained soil on flood plains. It has the profile described as representative for the series. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high. Slopes are 0 to 2 percent, and runoff is slow. Most areas are subject to flooding for short periods, and surface drainage generally is needed. Included in mapping are small areas of Cascilla, Collins, Falaya, Rosebloom, and Vicksburg soils.

This soil is well suited to hardwoods. If well managed, it is suited to cotton, corn, soybeans, small grains, selected truck crops, and pasture plants.

Supplemental drainage, arrangement of crop rows, proper tillage, and adequate fertilization are important in management. Proper use of crop residue preserves tilth. (Capability unit IIw-1; woodland group 1w8)

Arkabutla-Rosebloom association (AR).--This association is about 36 percent somewhat poorly drained Arkabutla silt loam and 30 percent poorly drained Rosebloom silt loam. The rest is mainly Cascilla, Collins, and Vicksburg soils along natural levees of old stream channels. This unit has been mapped at low intensity. The composition is more variable than that of most mapping units in the county, but has been controlled well enough to interpret for the expected use of the soils. Slopes are 0 to 2 percent, and runoff is slow.

Arkabutla silt loam occurs on broad flats adjacent to streams. The surface layer is brown and about 6 inches thick. The upper part of the subsoil is brown silty clay loam that extends to a depth of about 15 inches. The lower part is gray silty clay loam mottled with brown. Permeability is moderate, and the available water capacity is very high.

Rosebloom silt loam generally occurs in depressional and slack-water areas nearer the hills. The surface layer is dark grayish brown and is about 4 inches thick. The upper part of the subsoil is mottled light brownish-gray, pale-brown, and brown silty clay loam that extends to a depth of 8 inches. The lower part is gray to light brownish-gray silty clay loam mottled with yellowish brown. Permeability is slow, and the available water capacity is very high. Reaction is strongly acid to very strongly acid.

This association is frequently flooded and is used as a floodwater retention area for the Sardis Reservoir. It is suited to pasture plants, but the flood hazard restricts use mainly to wildlife habitat and woodland. Most of the acreage is in hardwood trees. (Both soils are in capability unit IVw-2; Arkabutla soil is in woodland group 1w9; Rosebloom soil is in woodland group 2w9)

Bruno Series

The Bruno series consists of excessively drained, nearly level soils on flood plains. In this county, Bruno soils are mapped only with Arkabutla and Collins soils.

Typically, the surface layer is yellowish-brown sandy loam about 8 inches thick. The next layer is dark yellowish-brown and yellowish-brown silt loam that extends to a depth of 13 inches. Below this, extending to a depth of 54 inches, is light yellowish-brown loamy sand that has strata of loam and sandy loam.

Representative profile of Bruno sandy loam, 2 miles west of the intersection of Mississippi Highway 7 and Highway 310, and 3/4 mile north of Highway 310, SE1/4 NE1/4 SE1/4 sec. 5, T. 6 S., R. 3 W.:

Ap--0 to 8 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

C1--8 to 13 inches, dark yellowish-brown (10YR 4/4) and yellowish-brown (10YR 5/4) silt loam; structureless; very friable; few fine roots; thin bedding planes; strongly acid; abrupt, smooth boundary.

C2--13 to 54 inches, light yellowish-brown (10YR 6/4) loamy sand; structureless; loose; strata of loam and sandy loam; strongly acid.

The Ap horizon is silt loam, loam, sandy loam, or loamy sand and ranges from brown or strong brown to yellowish brown. The C1 horizon is silt loam, loam, sandy loam, or loamy sand. It is reddish brown, yellowish red, strong brown, yellowish brown, dark yellowish brown, light yellowish brown, or brownish yellow. The C2 horizon is loamy sand or sand and contains strata of loam and sandy loam. It has colors similar to those of the C1 horizon. Reaction ranges from strongly acid to mildly alkaline.

Bruno soils are associated with Arkabutla, Collins, and Ochlockonee soils. They are coarser textured between depths of 10 and 40 inches than those soils and are better drained.

Cahaba Series

The Cahaba series consists of well-drained soils on uplands.

Typically, the surface layer is dark-brown loam about 1 inch thick. The subsurface layer is yellowish-brown loam 6 inches thick. The subsoil is reddish-brown to red sandy clay loam that extends to a depth of 34 inches. The substratum is red sandy loam.

Representative profile of Cahaba loam, 1/4 mile south of intersection of Mississippi Highway 4 and Highway 7, S1/2 NW1/4 sec. 4, T. 4 S., R. 3 W.:

A1--0 to 1 inch, dark-brown (10YR 3/3) loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

A2--1 to 7 inches, yellowish-brown (10YR 5/4) loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B21t--7 to 21 inches, reddish-brown (5YR 4/4) sandy clay loam; moderate, medium, subangular blocky structure; friable, slightly sticky; few fine roots; patchy clay films; strongly acid; clear, wavy boundary.

B22t--21 to 34 inches, red (2.5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; few patchy clay films; strongly acid; clear, wavy boundary.

C--34 to 56 inches, red (2.5YR 4/8) sandy loam; structureless; very friable; very strongly acid.

Where present, the A1 horizon is thin and ranges from very dark grayish brown or grayish brown to dark brown. The Ap and A2 horizons are loam or silt loam and brown, strong brown, reddish brown, or yellowish brown. The B2t horizon is sandy clay loam, clay loam, or loam and is red, yellowish red, or reddish brown. Depth to the C horizon ranges from 32 to 44 inches. The C horizon is sandy loam or loamy sand and is red, yellowish red, reddish brown, or strong brown. Reaction is strongly acid or very strongly acid, except where lime has been applied.

Cahaba soils are associated with Lexington, Luverne, Providence, and Susquehanna soils. They differ from Lexington and Providence in having more sand coarser than very fine sand in the upper 20 inches of the B horizon. They do not have the fragipan typical of Providence soils. They have a coarser textured B horizon than the Luverne soils. They have a less clayey B horizon and a thinner solum than the Susquehanna soils and are better drained.

Cahaba and Lexington soils, 12 to 30 percent slopes (CaE).--This unit occurs on rough, wooded, hilly uplands. It is about 45 percent well-drained Cahaba sandy loam and 35 percent well-drained Lexington silt loam. The rest is mainly Loring, Memphis, and Providence soils. Some areas consist entirely of Cahaba or Lexington soils, but most contain both soils. Runoff is rapid, and the erosion hazard is severe.

Cahaba sandy loam has a brown surface layer about 6 inches thick. The subsoil is red or reddish-brown sandy clay loam that extends to a depth of about 38 inches. The substratum is red sandy loam or loamy sand. Reaction is strongly acid or very strongly acid. The available water capacity is moderate, and permeability is moderate.

Lexington silt loam has a brown surface layer about 6 inches thick. The subsoil is brown silty clay loam that extends to a depth of about 40 inches. Below this is reddish-brown sandy loam. Reaction is medium acid to very strongly acid. The available water capacity is high, and permeability is moderate.

Because slopes are strong and the erosion hazard is severe, these soils are not suited to cultivated crops. They are suited to hardwood and pine trees or to permanent pasture. (Capability unit VIIe-1; woodland group 3r7)

Cahaba-Lexington association, hilly (CLF).--This association occurs on hilly uplands. It is about 60 percent well-drained Cahaba loam and 20 percent well-drained Lexington silt loam. The rest is mainly Collins, Falaya, Memphis, Providence, and Vicksburg soils. This unit has been mapped at low intensity. The composition is more variable than that of most units in the survey area, but has been controlled well enough to interpret for the expected use of the soils. Slopes range from 17 to 30 percent. Runoff is rapid, and the erosion hazard is severe.

Cahaba loam generally is on the middle and lower parts of slopes. The surface layer is dark brown to yellowish brown and about 7 inches thick. The subsoil is reddish-brown to red sandy clay loam that extends to a depth of about 34 inches. The substratum is red sandy loam. Reaction is strongly acid or very strongly acid. The available water capacity is moderate, and permeability is moderate.

Lexington silt loam is on ridgetops and the upper part of side slopes. The surface layer is brown and about 5 inches thick. The subsoil is brown silty clay loam that extends to a depth of about 37 inches. Below this is reddish-brown sandy loam. Reaction is medium acid to very strongly acid. The available water capacity is high, and permeability is moderate.

Because slopes are steep and the erosion hazard is severe, these soils are not suited to cultivated crops. They are suited to hardwood and pine trees and to pasture. (Capability unit VIIe-1; woodland group 3r7)

Cahaba-Providence complex, 12 to 30 percent slopes, severely eroded (CbE3).--This complex occurs on rough, hilly uplands. It is 44 percent well-drained Cahaba sandy loam and 41 percent moderately well drained Providence silt loam. The rest is mainly Memphis and Lexington soils.

Runoff is rapid, and the hazard of erosion is severe. In much of the acreage the surface layer has been thinned through erosion and is now mixed with subsoil material. There are spots where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Rills and shallow gullies are common, and a few deep gullies have formed.

Cahaba sandy loam generally is on the middle and lower parts of hillsides. The surface layer is brown or reddish brown and about 3 inches thick. The subsoil is reddish-brown or red sandy clay loam that extends to a depth of about 30 inches. This is underlain by red sandy loam. Reaction is strongly acid or very strongly acid. The available water capacity is moderate, and permeability is moderate.

Providence silt loam generally is on the ridgetops and the upper part of hillsides. The surface layer is dark yellowish brown and about 3 inches thick. The upper part of the subsoil is dark-brown silty clay loam. At a depth of about 26 inches is a silt loam and loam fragipan that is brown and strong brown mottled with gray. Reaction is strongly acid or very strongly acid. The available water capacity is moderate. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan.

Because slopes are strong and the erosion hazard is severe, these soils are not suited to cultivated crops. They are suited to pine trees and to permanent pasture. Most of the acreage has been replanted to loblolly pine or has a cover of scrubby hardwoods. (Capability unit VIIe-2; woodland group 3r2)

Calloway Series

The Calloway series consists of somewhat poorly drained soils that have a fragipan. These soils are on uplands.

Typically, the surface layer is brown silt loam about 5 inches thick. The upper part of the subsoil, about 5 inches thick, is light yellowish-brown silt loam mottled with shades of brown, gray, and yellow. Below this is mottled pale-brown, light brownish-gray, and brownish-yellow silt loam about 4 inches thick. The next layer, about 8 inches thick, is light-gray silt loam mottled with shades of brown and yellow. Below a depth of 22 inches is a brittle and compact silty clay loam fragipan that is mottled with shades of gray, brown, and yellow.

Representative profile of Calloway silt loam, 2 to 5 percent slopes, eroded, 1/2 mile west of Cornersville, in a lespedeza pasture, 40 feet west of a field road, 660 feet south of Mississippi Highway 349, NW1/4 NE1/4 SW1/4, sec. 26, T. 6 S., R. 1 W.:

Ap--0 to 5 inches, brown (10YR 5/3) silt loam; common, medium, faint, light yellowish-brown (10YR 6/4) mottles; weak, fine, granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

B21--5 to 10 inches, light yellowish-brown (10YR 6/4) silt loam; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles and common, distinct, light brownish-gray (10YR 6/2)

mottles; moderate, medium, subangular blocky structure; friable; few fine roots; few fine pores; strongly acid; clear, smooth boundary.

B22--10 to 14 inches, mottled pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), and brownish-yellow (10YR 6/6) silt loam; moderate, medium, subangular blocky structure; friable; few fine roots; few fine pores; strongly acid; clear, smooth boundary.

A'2--14 to 22 inches, light-gray (10YR 7/1) silt loam; common, medium and coarse, distinct, brownish-yellow (10YR 6/6) mottles and common, medium and coarse, faint, pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable; few black and brown concretions; strongly acid; clear, smooth boundary.

B'x1--22 to 29 inches, mottled light-gray (10YR 6/1) and yellowish-brown (10YR 5/6) silty clay loam; moderate, coarse, prismatic structure that parts to weak to moderate, medium, angular and subangular blocky; firm, slightly plastic, compact and brittle; clay films on ped faces; common fine voids; strongly acid; clear, smooth boundary.

B'x2--29 to 45 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; moderate, coarse, prismatic structure that parts to moderate, medium, angular and subangular blocky; firm, slightly plastic, compact and brittle; continuous clay films on ped faces; common fine voids; cracks along faces of prisms are filled with light-gray silt; strongly acid; clear, smooth boundary.

B'x3--45 to 54 inches, mottled brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/4), and light-gray (10YR 7/1) silty clay loam; moderate, coarse, prismatic structure that parts to moderate, medium, angular and subangular blocky; firm, slightly plastic, compact and brittle; continuous clay films on ped faces; cracks are filled with light-gray silt; strongly acid.

The A1 horizon, where present, is dark grayish brown or grayish brown. The Ap horizon ranges from brown to dark yellowish brown. The B2 horizon above the fragipan is yellowish brown or light yellowish brown mottled with light brownish gray or shades of brown, yellow, and gray. The A'2 horizon is thin, discontinuous, and light gray, light brownish gray, pale brown, or light yellowish brown mottled with shades of brown and yellow. The B'x horizon is silt loam or silty clay loam and light gray or light brownish gray mottled with yellowish brown or shades of gray, brown, and yellow. Reaction is medium acid or strongly acid, except where the surface layer has been limed.

Calloway soils are associated with Grenada, Henry, Loring, and Memphis soils. They have gray mottles in the uppermost 16 inches which Grenada soils lack. They have a B2 horizon above the fragipan whereas the Loring and Memphis soils have a B2t horizon above the fragipan and are better drained. They have a fragipan and Memphis soils do not. They are better drained and browner than Henry soils, which are poorly drained and gray.

Calloway silt loam, 0 to 2 percent slopes (CcA).--This is a somewhat poorly drained, nearly level soil on broad ridgetops and stream terraces. It has the profile described as representative for the series. The available water capacity is moderate, and the reaction is medium acid to strongly acid. Permeability is moderate in the upper part of the subsoil and slow in the fragipan. Water perches above the fragipan during rainy periods. Included in mapping are small areas of Henry silt loam and Grenada silt loam. Also included are a few areas where the surface layer contains recent deposits of silty alluvium.

This soil is suited to cotton, corn, soybeans, small grains, and pasture plants, and to nursery stocks, hardwoods, and pine trees (pl. I, bottom). Drainage, proper tillage, and adequate fertilization are needed for crops. If well managed, this soil can be used continuously for cultivated crops. Most of the acreage is used for crops and pasture. (Capability unit IIIw-1; woodland group 2w8)

Calloway silt loam, 2 to 5 percent slopes, eroded (CcB2).--This is a somewhat poorly drained, gently sloping soil on broad ridgetops. The surface layer is brown to dark yellowish-brown silt loam about 5 inches thick. The upper part of the subsoil, about 9 inches thick, is light yellowish-brown silt loam mottled with shades of gray. Below this is a thick silty clay loam fragipan that is mottled with brown, gray, and yellow. Reaction is medium acid to strongly acid. Permeability is moderate in the upper part of the subsoil and slow through the fragipan. The available water capacity is moderate.

Runoff is slow to medium, and the erosion hazard is slight. The surface layer has been thinned through erosion and is mixed with subsoil material. Rills and shallow gullies have formed in most fields.

This soil is suited to cotton, corn, soybeans, small grains, and pasture, and to nursery plants, hardwoods, and pine trees. Management should include drainage, arrangement of crop rows, adequate fertilizer, and proper tillage. Tilth can be maintained only within a narrow range of moisture content. If well managed, this soil can be used continuously for cultivated crops. Most of the acreage is in cultivated crops and pasture. (Capability unit IIIw-1; woodland group 2w8)

Cascilla Series

The Cascilla series consists of well-drained soils on flood plains.

Typically, the surface layer is dark-brown silt loam about 7 inches thick. The subsoil is silt loam that extends to a depth of 60 inches. It is dark

brown between depths of 7 and 12 inches and dark yellowish brown between depths of 12 and 60 inches. It is mottled with shades of gray and brown to a depth of 52 inches, and with yellowish brown and light brownish gray to a depth of 60 inches.

Representative profile of Cascilla silt loam, 4 miles east of Galena, 990 feet north of Mississippi Highway 4, and 45 feet east of a drainage ditch, SW1/4 SE1/4 SE1/4, sec. 28, T. 4 S., R. 3 W.:

Ap--0 to 7 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; few fine roots; medium acid; abrupt, smooth boundary.

B21--7 to 12 inches, dark-brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; few worm casts; strongly acid; clear, smooth boundary.

B22--12 to 33 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; thin clay films in some pores; strongly acid; clear, smooth boundary.

B23--33 to 40 inches, dark yellowish-brown (10YR 4/4) silt loam; few, fine, distinct, light brownish-gray and pale-brown mottles; weak, medium, subangular blocky structure; friable; thin clay films in some pores; very strongly acid; clear, smooth boundary.

B24--40 to 52 inches, dark yellowish-brown (10YR 4/4) silt loam; common, medium, faint, yellowish-brown (10YR 5/4) and pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable; very strongly acid; clear, smooth boundary.

B25--52 to 60 inches, mottled dark yellowish-brown (10YR 3/4) and light brownish-gray (10YR 6/2) silt loam; weak, medium, subangular blocky structure; friable; very strongly acid.

A thin A1 horizon occurs in undisturbed areas. It ranges from very dark grayish brown, dark grayish brown, and grayish brown to dark brown. The Ap horizon is dark brown and brown to dark yellowish brown and yellowish brown. The B21 and B22 horizons are silt loam or silty clay loam and dark brown, brown, dark yellowish brown, or yellowish brown. The B23 and B24 horizons are silt loam or silty clay loam and brown, yellowish brown, or dark yellowish brown mottled with shades of gray and brown. The B25 horizon is silt loam or silty clay loam mottled with shades of gray, brown, and yellow. Reaction is strongly acid or very strongly acid, except where the soil has been limed.

Cascilla soils are associated with Arkabutla, Collins, Falaya, and Vicksburg soils. They are better drained than the Arkabutla, Collins, and Falaya soils. They have a browner B horizon than Arkabutla and Falaya soils. They have a B horizon whereas Collins and Vicksburg soils do not.

Cascilla silt loam (Cm).--This is a well-drained soil on flood plains. Slopes are 0 to 2 percent, and runoff is slow. Reaction is strongly acid or very strongly acid, except where the soil has been limed. Permeability is moderate, and the available water capacity is high to very high. Included in mapping are small areas of Arkabutla, Collins, and Vicksburg soils.

This soil is well suited to cotton, corn, soybeans, selected truck crops, small grains, and pasture plants. If adequately fertilized and properly tilled, it can be used for row crops continuously. Surface drainage is needed in places. Most of the acreage is used for cultivated crops. (Capability unit I-1; woodland group 1o7)

Collins Series

The Collins series consists of moderately well drained soils on flood plains.

Typically, the surface layer is brown silt loam about 6 inches thick. The next layer, about 16 inches thick, is yellowish-brown silt loam mottled with light gray. Below a depth of about 22 inches are layers of silt loam mottled with shades of brown and gray.

Representative profile of Collins silt loam, in a cotton field, 1 3/4 miles south of Byhalia, 1/4 mile west of Mississippi Highway 309, and 230 feet north of a fence row, NW1/4 NE1/4 NE1/4 sec. 11, T. 3 S., R. 5 W.:

Ap--0 to 6 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

C1--6 to 22 inches, yellowish-brown (10YR 5/4) silt loam; few, fine, distinct, light-gray mottles; massive; friable; thin bedding planes; strongly acid; clear, smooth boundary.

C2--22 to 30 inches, mottled pale-brown (10YR 6/3), dark-brown (7.5YR 4/4), and light-gray (2.5Y 7/2) silt loam; massive; friable; thin bedding planes; strongly acid; clear, smooth boundary.

C3--30 to 50 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, distinct, dark yellowish-brown (10YR 3/4) and light-gray (2.5Y 7/2) mottles; massive; friable; thin bedding planes; common, fine, black and brown stains; very strongly acid; clear, smooth boundary.

C4--50 to 60 inches, mottled yellowish-brown (10YR 5/4) and light-gray (10YR 7/2) silt loam; massive; friable; common, fine, black and brown concretions and stains; very strongly acid; clear, wavy boundary.

Where present, the A1 horizon ranges from dark grayish brown and grayish brown to dark brown. The Ap horizon is brown to strong brown or dark yellowish brown. The upper part of the C horizon is brown, strong brown, or yellowish brown, and has light-gray or light brownish-gray mottles within a depth of 20 inches. The lower part of the C horizon is brown to yellowish brown mottled with light gray to light brownish gray or shades of brown, yellow, and gray. Reaction is strongly acid or very strongly acid, except where the surface layer has been limed.

Collins soils are associated with Arkabutla, Bruno, Cascilla, Falaya, Ochlockonee, Rosebloom, and Vicksburg soils. They are better drained than Arkabutla, Falaya, and Rosebloom soils and lack the B horizon typical of those soils. They are finer textured and less well drained than the excessively drained Bruno soils. They lack the B horizon typical of the Cascilla soils and are not so well drained. They contain more silt and less sand than the Ochlockonee soils and are less well drained. They are not so well drained as the Vicksburg soils.

Collins silt loam (Co).--This is a moderately well drained soil on flood plains. It has the profile described as representative for the series. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high. Slopes are 0 to 2 percent, and runoff is slow. Most areas are subject to occasional flooding. Included in mapping are small areas of Arkabutla, Falaya, Ochlockonee, and Vicksburg soils.

If adequately fertilized, this soil is well suited to cotton, corn, soybeans, small grains, selected truck crops, and pasture plants. Surface drainage is needed in places. If this soil is drained and properly tilled, and if rows are well arranged, cultivated crops can be grown continuously. Tilth can be maintained by proper use of crop residue. (Capability unit IIw-1; woodland group 1o7)

Collins-Arkabutla-Bruno association (CN).--This association is 42 percent moderately well drained Collins silt loam, 24 percent somewhat poorly drained Arkabutla silt loam, and 15 percent excessively drained Bruno sandy loam. The rest is mainly Cascilla, Ochlockonee, and Vicksburg soils. This unit was mapped at low intensity. The composition is more variable than that of most other mapping units in the survey area, but has been controlled well enough to interpret for the expected use of the soils. Slopes range from 0 to 2 percent, and runoff is slow.

Collins silt loam occurs on or near the natural levees of streams. The surface layer is brown and about 6 inches thick. It is underlain by yellowish-brown silt loam, about 15 inches thick, that is mottled with light gray. Below this is yellowish-brown silt loam, about 24 inches thick, that is mottled with shades of gray and brown. Reaction is strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is very high.

Arkabutla silt loam generally occurs between the hills and the natural levees of streams. The surface layer is dark brown and about 6 inches thick. The upper 10 inches of the subsoil is brown silty clay loam mottled with shades of gray. The lower part of the subsoil is gray silty clay loam mottled with shades of brown. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high.

Bruno sandy loam generally occurs on natural levees or alluvial fans on the flood plains. The surface layer is yellowish brown and about 8 inches thick. The next layer is yellowish-brown silt loam that extends to a depth of about 13 inches. Below this is yellowish-brown loamy sand. Reaction is strongly acid to mildly alkaline. Permeability is moderately rapid, and the available water capacity is low.

This association is suited to row crops and pasture, but is best suited to wildlife habitat and hardwood trees. It is frequently flooded. A complete flood-control and drainage system is needed for crops. Most of the acreage is in hardwood trees. (All the soils are in capability unit IVw-2; Collins soil is in woodland group 1w8; Arkabutla soil is in group 1w9; Bruno soil is in group 2s5)

Collins-Arkabutla-Falaya association (CR).--This association is 50 percent moderately well drained Collins silt loam, 27 percent somewhat poorly drained Arkabutla silt loam, and 13 percent somewhat poorly drained Falaya silt loam. The rest is mainly Cascilla, Ochlockonee, and Vicksburg soils. This unit has been mapped at low intensity. The composition is more variable than that of most other mapping units in the survey area, but has been controlled well enough to interpret for the expected use of the soils. Slopes range from 0 to 2 percent, and runoff is slow.

Collins silt loam occurs near the natural levees of streams. The surface layer is brown and about 6 inches thick. It is underlain by yellowish-brown silt loam, about 14 inches thick, that is mottled with light gray. Below a depth of about 20 inches are layers of yellowish-brown silt loam mottled with shades of gray. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high.

Arkabutla silt loam generally occurs in slack-water areas between natural levees and the hills. The surface layer is dark brown and about 6 inches thick. The subsoil, to a depth of about 15 inches, is silty clay loam mottled with shades of brown and gray. The lower part of the subsoil is gray silty clay loam mottled with shades of brown. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high.

Falaya silt loam generally occurs between natural levees and slack-water areas. The surface layer is dark brown and about 7 inches thick. The subsoil is dark-brown silt loam mottled with light brownish gray. It extends to a depth of about 16 inches. Below this is light-gray silt loam mottled with shades of brown. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high.

This association is suited to row crops and pasture, but is best suited to hardwood trees and wildlife habitat. It is frequently flooded. Flood

protection and drainage are needed for crops. Most of the acreage is in hardwood trees. (All the soils are in Capability unit IVw-2; Collins soil is in woodland group 1w8; Arkabutla and Falaya soils are in woodland group 1w9)

Falaya Series

The Falaya series consists of somewhat poorly drained soils on flood plains.

Typically, the surface layer is dark-brown silt loam about 7 inches thick. The subsoil, to a depth of about 16 inches, is dark-brown silt loam mottled with light brownish gray. Below 16 inches, it is light-gray silt loam mottled with shades of brown.

Representative profile of Falaya silt loam, in a bean field, 2 miles west of Cornersville, 475 feet east of Mississippi Highway 349, and 100 feet south of a hedgerow, NW1/4 SW1/4 SW1/4 sec. 23, T. 6 S., R. 1 W.:

Ap--0 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; few fine roots; few black and brown concretions; strongly acid; abrupt, smooth boundary.

B1--7 to 16 inches, dark-brown (10YR 4/3) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few fine roots; common, medium, black and brown stains and concretions; strongly acid; clear, smooth boundary.

B21g--16 to 27 inches, light-gray (2.5Y 7/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fine roots; common, medium, black and brown concretions; strongly acid; clear, smooth boundary.

B22g--27 to 34 inches, light-gray (10YR 7/1) silt loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; common, medium, black and brown concretions; strongly acid; clear, smooth boundary.

B23g--34 to 42 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; common, medium and coarse, black and brown concretions and stains; strongly acid; clear, smooth boundary.

B24g--42 to 60 inches, gray (10YR 6/1) silt loam ped surface or coatings; very dark grayish-brown (10YR 3/2) ped interiors; moderate, medium, angular blocky structure; friable; common, medium and coarse, soft, black and brown concretions and stains; strongly acid.

Where present, the A1 horizon is thin and ranges from very dark grayish brown to grayish brown. The Ap horizon is dark brown to brown. The B1 horizon is dark-brown, brown, or yellowish-brown silt loam mottled with gray and light brownish gray. The B2 horizons are light-gray, gray, or light brownish-gray silt loam mottled with shades of brown and yellow. Reaction is strongly acid to very strongly acid, except where the surface layer has been limed.

Falaya soils are associated with Arkabutla, Cascilla, Collins, Ochlockonee, Rosebloom, and Vicksburg soils. Their B horizon contains less clay than that of Arkabutla soils. They are more poorly drained than Collins soils. They have grayer colors in the upper part of the solum than the well-drained Cascilla soils. Falaya soils contain more silt in the control section and are more poorly drained than Ochlockonee soils. They have browner colors in the upper part of the solum than the poorly drained Rosebloom soils. In contrast with Vicksburg soils, they have a B horizon and are grayer and more poorly drained.

Falaya silt loam (Fa).--This is a somewhat poorly drained soil on flood plains. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is very high. Slopes are 0 to 2 percent, and runoff is slow. Most areas are occasionally flooded. Included in mapping are small areas of Arkabutla, Collins, Ochlockonee, and Rosebloom soils.

This soil is well suited to cotton, corn, soybeans, selected truck crops, and small grains, and to pasture. Management should include drainage, arrangement of crop rows, proper tillage, and adequate fertilization. Tilth can be maintained by proper use of crop residue. Surface drainage generally is needed. (Capability unit IIw-1; woodland group 1w8)

Grenada Series

The Grenada series consists of moderately well drained soils that have a fragipan. These soils occur on uplands.

Typically, the surface layer is brown and dark-brown silt loam about 5 inches thick. The subsoil, to a depth of about 23 inches, is dark yellowish-brown and yellowish-brown silt loam mottled with light brownish gray in the lower part. At a depth of about 23 inches is mottled grayish and brownish silt loam. Below a depth of about 33 inches is a fragipan of mottled dark-brown and light brownish-gray silt loam that is compact and brittle.

Representative profile of Grenada silt loam, 2 to 5 percent slopes, eroded, in a pasture, 825 feet southeast of North Mississippi Branch Experiment Station irrigation pond, SW1/4 SE1/4 NE1/4 sec. 17, T. 3 S., R. 2 W.:

Ap--0 to 5 inches, mottled dark-brown (10YR 3/3) and brown (10YR 5/3) silt loam; weak, fine, granular and subangular blocky structure; friable; many fine roots; medium acid; abrupt, wavy boundary.

B1--5 to 8 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular and subangular blocky structure; friable; common fine roots; strongly acid; clear, wavy boundary.

B21--8 to 18 inches, yellowish-brown (10YR 5/4) silt loam; moderate, medium, subangular blocky structure; friable; few fine roots; very few clay films in pores; common fine pores; strongly acid; clear, wavy boundary.

B22--18 to 23 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, faint, yellowish-brown (10YR 5/6) mottles and common, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; friable; few fine roots; common fine pores; common, distinct, black stains; strongly acid; clear, wavy boundary.

A'2--23 to 33 inches, mottled light-gray (10YR 6/1), light brownish-gray (10YR 6/2), brown (10YR 5/3), and dark yellowish-brown (10YR 4/4) silt loam; weak to moderate, fine and medium, subangular blocky structure; friable to firm; strongly acid; clear, irregular boundary.

B'x1--33 to 43 inches, mottled light brownish-gray (2.5YR 6/2) and dark-brown (7.5YR 4/4) silt loam; moderate, medium, subangular blocky structure; firm, compact and brittle; clay films on ped faces; few fine voids; few, fine, distinct, black stains; light-gray and light brownish-gray silt coatings on ped faces and in polygonal cracks; strongly acid; clear, wavy boundary.

B'x2--43 to 59 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium and coarse, subangular blocky structure; firm, compact and brittle; clay films on ped faces; few fine voids; light-gray and light brownish-gray silt coatings on ped faces and in polygonal cracks; common, fine, distinct, black stains; strongly acid; clear, wavy boundary.

B'x3--59 to 80 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, coarse, angular blocky structure; firm, compact and brittle; clay films on ped faces and bridging peds; common, fine, distinct, black stains; light-gray and light brownish-gray silt coatings on ped faces and in polygonal cracks; strongly acid.

Where present, the A1 horizon ranges from dark brown to dark grayish brown or grayish brown. The Ap horizon is brown, dark brown, dark yellowish brown, or yellowish brown. The B horizon above the fragipan is silt loam or silty clay loam. It is yellowish brown or dark yellowish brown mottled with light brownish gray in the lower part. The A'2 horizon is mottled gray, light gray, light brownish gray, brown, light yellowish brown, or dark yellowish brown. The B'x1 horizon is mottled in shades of gray and brown. The B'x2 and B'x3 horizons are silt loam or silty clay loam. They are dark brown distinctly mottled with light brownish gray or with shades of brown and gray. Reaction is medium acid to strongly acid, except where the surface has been limed.

Grenada soils are associated with Calloway, Henry, Memphis, Loring, and Providence soils. They lack the grayish mottles in the upper part of the B horizon typical of Calloway soils. They are better drained than the Henry soils. They lack the Bt horizon above the fragipan typical of Loring and Providence soils. They differ from Memphis soils in having a fragipan.

Grenada silt loam, 0 to 2 percent slopes (GrA).--This is a moderately well drained soil on ridgetops. The surface layer is brown silt loam about 6 inches thick. The subsoil, to a depth of about 19 inches, is yellowish-brown silt loam mottled with light brownish gray in the lower part. At a depth of about 25 inches is gray silt loam. Below a depth of 29 inches is a compact and brittle fragipan of mottled, dark-brown and light brownish-gray silt loam.

Reaction is strongly acid to medium acid. The available water capacity is moderate. Permeability is moderate above the fragipan and slow in the fragipan. The water table is perched above the pan during periods of heavy rainfall. Runoff is slow. Included in mapping are small areas of Calloway and Loring silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, truck crops, and pasture plants, and to hardwoods and loblolly and shortleaf pines. If management includes drainage, arrangement of crop rows, proper tillage, and adequate fertilization, this soil can be cultivated continuously. Most of the acreage is used for row crops and pasture. (Capability unit IIw-2; woodland group 2o7)

Grenada silt loam, 2 to 5 percent slopes, eroded (GrB2).--This is a moderately well drained soil on ridgetops. It has the profile described as representative for the series. Reaction is strongly acid to medium acid. The available water capacity is moderate. Permeability is moderate above the fragipan and slow through the fragipan.

Runoff is slow to medium, and the erosion hazard is moderate in cultivated areas. In places the surface layer has been thinned through erosion and is mixed with subsoil material. A few rills and shallow gullies have formed, and deep gullies occur in places. Included in mapping are small areas of Calloway and Loring silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, truck crops, and pasture plants and to hardwoods and loblolly and shortleaf pines. If management includes terracing, contour cultivation, grass waterways, proper tillage, and adequate fertilization, cultivated crops that leave large amounts of residue can be grown year after year. Tilth can be maintained by proper use of crop residue. Most of the acreage is used for

cultivated crops or pasture. The rest is woodland. (Capability unit IIe-2; woodland group 2o7)

Grenada silt loam, 5 to 8 percent slopes, severely eroded (GrC3).--This is a moderately well drained soil on ridgetops and hillsides. The surface layer is yellowish-brown silt loam about 2 inches thick. The upper part of the subsoil is yellowish-brown silt loam about 16 inches thick. At a depth of about 18 inches is gray silt loam. Below 23 inches is a thick fragipan of mottled light brownish-gray and dark-brown silt loam. Reaction is strongly acid to medium acid. The available water capacity is moderate. Permeability is moderate above the fragipan and slow through it.

Runoff is medium to rapid, and the erosion hazard is severe in cultivated areas. Rills and shallow gullies are common, and a few deep gullies have formed. There are many areas, as much as 20 feet wide and 60 feet long, where the surface layer and much of the upper part of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Memphis and Loring silt loams.

This soil is suited to cotton, corn, soybeans, small grains, truck crops, and pasture plants, and to loblolly and shortleaf pines. It is best suited to permanent pasture or trees. If it is terraced and cultivated on the contour, row crops can be grown in a cropping system that includes grasses and legumes. This soil crusts and packs if left bare. Tilth can be improved and maintained by proper use of crop residue. About three-fourths of the acreage is used for cultivated crops and pasture. The rest is woodland. (Capability unit IVe-1; woodland suitability group 3o2)

Gullied Land

Gullied land is so eroded that only small areas of the original soils remain between the gullies. The gullies are 2 to 30 feet deep. The soil material washed from the gullies ranges from silty to sandy in texture. Slopes range from 5 to 30 percent.

Gullied land-Cahaba complex, 5 to 30 percent slopes (GuE).--This complex consists of gullies and eroded, well-drained soils that occur in an intricate pattern on hillsides and ridgetops. It is about 60 percent Gullied land and 30 percent Cahaba loam. The rest is mainly Lexington, Loring, and Providence soils. Runoff is rapid, and the erosion hazard is very severe where the soils are not protected.

Cahaba loam generally is on the hillsides. The surface layer is yellowish brown and about 6 inches thick. The subsoil is yellowish-red or red sandy clay loam that extends to a depth of about 30 inches. The substratum is yellowish-red sandy loam. Reaction is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is moderate.

This complex is suited to loblolly pine. About one-fifth of the acreage is idle land. The rest has been planted to pine trees. (Capability unit VIIe-5; not assigned to a woodland group)

Gullied land-Loring complex, 5 to 30 percent slopes (GvE).--This complex consists of gullies and moderately well drained soils that occur in an intricate pattern on hillsides and ridgetops. It is about 60 percent Gullied land and 30 percent Loring silt loam. The rest is mainly Grenada and Providence soils. Runoff is rapid, and the erosion hazard is very severe where the soils are not protected.

Loring silt loam has a dark yellowish-brown or brown surface layer about 5 inches thick. The upper part of the subsoil is brown silty clay loam about 20 inches thick. At a depth of about 25 inches is a compact and brittle fragipan of brown silt loam mottled with shades of gray. Reaction is strongly acid to medium acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate to high.

This complex is suited to loblolly pine. About one-fourth of the acreage is idle land. The rest has been planted to pine trees. (Capability unit VIIe-5; not assigned to a woodland group)

Henry Series

The Henry series consists of poorly drained soils that have a fragipan. These soils occur in depressions and broad drainageways on uplands.

Typically, the surface layer is dark-gray silt loam about 2 inches thick. The subsurface layer, extending to a depth of about 22 inches, is light-gray and light brownish-gray silt loam. Below this is a brittle and compact fragipan that is light-gray silty clay loam in the upper part and light-gray and light brownish-gray silt loam mottled with brown in the lower part. The fragipan extends to a depth of about 56 inches.

Representative profile of Henry silt loam, in a park near the North Mississippi Branch Experiment Station, 201 feet north of silo, 201 feet west of road, NE1/4 SW1/4 NE1/4, sec. 17, T. 3 S., R. 2 W.:

A1--0 to 2 inches, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; friable; many fine roots; medium acid; clear, wavy boundary.

A21g--2 to 4 inches, light-gray (10YR 6/1) silt loam; weak, fine, granular structure; friable; common fine and medium roots; strongly acid; clear, wavy boundary.

A22g--4 to 7 inches, light brownish-gray (10YR 6/2) silt loam; weak, fine, granular and subangular blocky structure; friable; few fine roots; strongly acid; clear, wavy boundary.

A23g--7 to 22 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium to coarse, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, angular and subangular blocky structure; friable; few fine roots; very strongly acid; abrupt, wavy boundary.

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Bx1--22 to 27 inches, light-gray (10YR 6/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, prismatic structure that parts to moderate, medium, subangular blocky; firm, compact and brittle, slightly plastic; thick, continuous clay films on ped faces; common fine pores; few, fine and medium, black stains and concretions; very strongly acid; clear, wavy boundary.

Bx2--27 to 44 inches, light-gray (10YR 7/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/8) and dark yellowish-brown (10YR 4/4) mottles; weak, prismatic structure that parts to moderate, medium, subangular blocky; firm, compact and brittle; thin, patchy clay films on ped faces; common fine pores; common, fine and medium, soft, brown concretions; strongly acid; clear, wavy boundary.

Bx3--44 to 56 inches, light brownish-gray (10YR 6/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/8) and dark yellowish-brown (10YR 4/4) mottles; weak, prismatic structure that parts to moderate, medium, subangular blocky; firm, compact and brittle; thin, patchy clay films on ped faces; common black and brown concretions; strongly acid; clear, wavy boundary.

B2tg--56 to 80 inches, light-gray (10YR 7/1) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) and dark yellowish-brown (10YR 4/4) mottles; weak, prismatic structure that parts to moderate, medium, subangular blocky; friable; thin, patchy clay films; common black and brown concretions and stains; strongly acid.

The A1 horizon ranges from very dark grayish brown to dark gray and very dark gray. The Ap horizon is gray, dark grayish brown, grayish brown, or light brownish gray. The A2 horizon is gray, light gray, or light brownish gray mottled with brown, yellowish brown, or brownish yellow. The Bx horizon is silty clay loam or silt loam that is gray, light gray, or light brownish gray mottled with brown, yellowish brown, strong brown, and brownish yellow. Reaction is medium acid to very strongly acid.

Henry soils are associated with Calloway, Grenada, Loring, and Memphis soils. They are grayer and more poorly drained than those soils. They have a fragipan which Memphis soils lack.

Henry silt loam (He).--This is a poorly drained soil in depressions and broad drainageways on uplands. Reaction is medium acid to very strongly acid. Permeability is slow, and the available water capacity is moderate. Slopes are 0 to 2 percent, and runoff is slow to very slow. Included in mapping are small areas of Calloway soils.

This soil is poorly suited to most of the row crops commonly grown in the county. It is suited to soybeans, to most grasses and legumes, and to hardwood and pine trees. Tilth can be maintained by proper use of crop residue. (Capability unit IVw-1; woodland group 3w9)

Lexington Series

The Lexington series consists of well-drained soils on uplands.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil, to a depth of 48 inches, is brown and dark yellowish-brown silty clay loam to silt loam. Below this it is reddish-brown sandy loam.

Representative profile of Lexington silt loam, 2 to 5 percent slopes, eroded, 5 miles south of Holly Springs, 528 feet east of Mississippi Highway 7, and 520 feet north of section line fence, SE1/4 SW1/4 SE1/4 sec. 25, T. 4 S., R. 3 W.:

Ap--0 to 5 inches, brown (10YR 4/3) silt loam; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles; weak, fine, granular structure; friable; many fine roots; medium acid; abrupt, smooth boundary.

B21t--5 to 14 inches, brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; patchy clay films; common fine roots; medium; clear, wavy boundary.

B22t--14 to 26 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium, subangular and angular blocky structure; friable, slightly plastic; few fine roots; patchy clay films; few, fine, distinct, black stains; strongly acid; clear, wavy boundary.

B23t--26 to 37 inches, brown (7.5YR 4/4) silt loam; few, fine, distinct, pale-brown silt coatings on ped faces; moderate, medium, subangular and angular blocky structure; friable; few fine roots; patchy clay films; few, fine, dark concretions and stains; strongly acid; clear, wavy boundary.

IIB24t--37 to 48 inches, brown (7.5YR 4/4) silt loam; few, fine, distinct, pale-brown silt coatings on ped faces; weak to moderate, medium, subangular and angular blocky structure; friable; few fine roots; patchy clay films; common, fine, distinct, black stains; strongly acid; clear, wavy boundary.

IIB25t--48 to 65 inches, reddish-brown (5YR 4/4) sandy loam; common, fine, distinct, pale-brown silt coatings on ped faces; weak, medium, subangular and angular blocky structure; friable; sand grains coated and bridged with clay; common, medium, distinct, black stains; very strongly acid.

The Ap horizon ranges from brown or strong brown to yellowish brown and dark yellowish brown. Where present, the A1 horizon is brown, dark grayish brown, or grayish brown. The B2 horizon is brown, strong-brown, dark yellowish-brown, or reddish-brown silty clay loam or silt loam. Depth to the IIB2t

horizon is 30 to 48 inches. This horizon is silt loam, sandy loam, loam, sandy clay loam, or clay loam and is brown, strong brown, yellowish red, reddish brown, or red. Reaction is medium acid to very strongly acid.

Lexington soils are associated with Cahaba, Loring, Luverne, Memphis, and Providence soils. They contain more sand in the lower B horizon than the Memphis soils. They have less sand in the upper part of the B horizon than Cahaba soils. They have less clay in the B horizon than the Luverne soils. They lack the fragipan typical of Providence and Loring soils.

Lexington silt loam, 2 to 5 percent slopes, eroded (LeB2).--This is a well-drained, gently sloping soil on ridgetops. It has the profile described as representative for the series. Reaction is medium acid to very strongly acid. Permeability is moderate, and the available water capacity is high.

Runoff is slow to medium, and the erosion hazard is slight to moderate where the soil is cultivated. A few rills have formed in most fields. In places the surface layer has been thinned through erosion and is mixed with subsoil material. Included in mapping are small areas of Loring, Memphis, and Providence silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, and pasture plants, and to hardwoods and loblolly and shortleaf pines. If management includes terraces, contour cultivation, grass waterways, proper tillage, and adequate fertilization, cultivated crops that leave large amounts of residue can be grown year after year. Tilth can be maintained by proper use of crop residue. Approximately three-fourths of the acreage is used for cultivated crops or pasture. The rest is woodland. (Capability unit IIe-1; woodland group 2o7)

Lexington silt loam, 5 to 8 percent slopes, severely eroded (LeC3).--This is a well-drained soil on ridgetops and hillsides. The surface layer is dark yellowish-brown silt loam about 3 inches thick. The upper part of the subsoil is brown silty clay loam. The lower part is reddish-brown loam. Reaction is medium acid to very strongly acid. Permeability is moderate, and the available water capacity is high.

Runoff is medium to rapid, and the erosion hazard is severe where this soil is cultivated. In most areas the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Memphis and Providence silt loams.

This soil is well suited to cotton, corn, soybeans, truck crops, and pasture plants, and to loblolly and shortleaf pines. It is best suited to permanent pasture or trees. If it is terraced and contour cultivated, row crops can be grown in a cropping system that includes grasses and legumes. Tilth can be improved and maintained by proper use of crop residue. About half the acreage is used for cultivated crops and pasture. The rest is woodland. (Capability unit IVe-1; woodland group 3o2)

Lexington silt loam, 8 to 12 percent slopes, severely eroded (LeD3).--This is a well-drained soil on hillsides. The surface layer is brown silt loam about 3 inches thick. The upper part of the subsoil is brown silty clay loam. The lower part is yellowish-red sandy clay loam. Reaction is medium acid to very strongly acid. Permeability is moderate, and the available water capacity is high.

Runoff is rapid, and the erosion hazard is severe where this soil is cultivated. In most areas the surface layer has been thinned through erosion and is mixed with subsoil material. Rills and shallow gullies are common, and a few deep gullies have formed. There are small areas where the original surface layer has been completely removed through erosion and the brown silty clay loam subsoil is at the surface. Also, there are spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Small areas of Cahaba and Memphis soils make up a small part of the acreage.

This soil is well suited to pasture plants and to loblolly and shortleaf pines. Permanent cover vegetation is needed to reduce erosion. Most of the acreage is used for pasture and trees. (Capability unit VIe-1; woodland group 3o2)

Loring Series

The Loring series consists of moderately well drained soils that have a fragipan. These soils occur on uplands.

Typically, the surface layer is dark yellowish-brown silt loam about 5 inches thick. The upper part of the subsoil is dark-brown and strong-brown silty clay loam that extends to a depth of about 26 inches. Below this is a dark-brown silt loam fragipan that is mottled with shades of gray, brown, and red.

Representative profile of Loring silt loam, 2 to 5 percent slopes, eroded, in a cornfield at the North Mississippi Branch Experiment Station, 175 feet east of field road running north and south, 50 feet north of another field road running east and west, SE1/4 NE1/4 SE1/4 sec. 17, T. 3 S., R. 2 W.:

Ap--0 to 5 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21t--5 to 17 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine roots; patchy clay films on vertical and horizontal ped faces; strongly acid; clear, wavy boundary.

B22t--17 to 26 inches, strong-brown (7.5YR 5/6) silty clay loam; many pale-brown silt coatings on ped faces; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine roots; patchy clay films on vertical and horizontal ped faces; few, fine and medium, black stains; strongly acid; clear, wavy boundary.

Bx1--26 to 38 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, coarse, prismatic structure that parts to moderate, medium, angular and subangular blocky; firm, compact and brittle; patchy clay films on ped faces; few fine voids; few, medium, black stains; polygonal cracks filled with gray silt extend into next horizon; strongly acid; clear, wavy boundary.

Bx2--38 to 53 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light-gray (10YR 7/2) mottles; weak, coarse, prismatic structure that parts to moderate, medium and coarse, angular and subangular blocky; firm, compact and brittle; patchy clay films; few fine voids; light-gray silt coatings on peds and in polygonal cracks; few, medium, black stains; strongly acid; clear, wavy boundary.

Bx3--53 to 67 inches, dark-brown (7.5YR 4/4) silt loam; few, medium, distinct, light brownish-gray (10YR 6/2) and pale-brown (10YR 6/3) mottles; moderate, medium, angular and subangular blocky structure; firm, compact and brittle; patchy clay films; silt coatings on peds and in polygonal cracks; medium acid; clear, wavy boundary.

Bx4--67 to 80 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) and yellowish-red (5YR 4/6) mottles; moderate, medium and coarse, angular blocky structure; firm, compact and brittle; patchy clay films on ped faces; polygonal cracks filled with light-gray silt; medium acid.

The Ap horizon ranges from brown to dark yellowish brown or yellowish brown. The A1 horizon is silt loam that is dark grayish brown or grayish brown. The B2t horizon is brown, dark-brown, or strong-brown silty clay loam or silt loam. The Bx horizon is brown to dark brown mottled with shades of brown, yellow, gray, and red. Reaction ranges from medium acid to strongly acid.

Loring soils are associated with Calloway, Grenada, Henry, Lexington, Memphis, and Providence soils. They have less sand in the lower part of the Bx horizon than Providence soils. They lack the bisequel profile typical of Calloway and Grenada soils. In contrast to Memphis soils, they have a fragipan. They are not so well drained as Lexington soils, have less sand in the lower part of the B horizon, and have a fragipan. They are browner and better drained than the poorly drained Henry soils.

Loring silt loam, 2 to 5 percent slopes, eroded (LoB2).--This is a moderately well drained soil on ridgetops. It has the profile described as representative for the series. Reaction is medium acid to strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate to high.

Runoff is slow to medium. The erosion hazard is slight to moderate in cultivated areas, and rills have formed in some fields. In places the surface layer has been thinned through erosion and is mixed with subsoil material. Included in mapping are small areas of Grenada, Memphis, and Providence silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, pasture plants, and loblolly and shortleaf pines. If management includes terraces, contour cultivation, grass waterways, proper tillage, and adequate fertilization, crops that leave large amounts of residue can be grown year after year. Proper use of crop residue preserves tilth. Most of the acreage is used for cultivated crops or pasture. Part is wooded. (Capability unit IIe-2; woodland group 2o7)

Loring silt loam, 5 to 8 percent slopes, severely eroded (LoC3).--This is a moderately well drained soil on ridgetops and hillsides. The surface layer is dark yellowish-brown silt loam 2 inches thick. The upper 18 inches of the subsoil is brown silty clay loam. Below this is a brown silt loam fragipan that is mottled with shades of gray and brown. Reaction is medium acid to strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate to high.

Runoff is medium to rapid, and the erosion hazard is severe in cultivated areas. In most areas the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Grenada, Memphis, and Providence silt loams.

This soil is suited to cotton, corn, soybeans, small grains, pasture plants, and loblolly and shortleaf pines. If terracing and contour cultivation are practiced, row crops can be grown in a cropping system that includes grasses and legumes. Proper use of crop residue preserves tilth. The soil is best suited to permanent pasture or woodland. Most of the acreage is used for cultivated crops or pasture. Part is wooded. (Capability unit IVe-1; woodland group 3o2)

Loring silt loam, 8 to 12 percent slopes, severely eroded (LoD3).--This is a moderately well drained soil on hillsides. The surface layer is yellowish-brown silt loam about 3 inches thick. The upper 15

inches of the subsoil is strong-brown silt loam. Below this is a brown silt loam fragipan that is mottled with shades of gray and yellow. Reaction is medium acid to strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate to high.

Runoff is rapid, and the erosion hazard is severe. In most areas the surface layer has been thinned through erosion and is only about 2 inches thick. Rills and shallow gullies are common, and a few deep gullies have formed. There are many spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Lexington, Memphis, and Providence silt loams.

Because slopes are strong and the erosion hazard is severe, this soil is best suited to trees or permanent vegetation. It is well suited to pasture plants and to loblolly and shortleaf pines. (Capability unit VIe-1; woodland group 3o2)

Luverne Series

The Luverne series consists of well-drained, acid soils that have a clayey subsoil. These soils occur on uplands.

Typically, the surface layer is loam 2 inches thick that has mixed colors in shades of brown. The subsurface layer is mottled yellowish-brown and yellowish-red sandy clay loam 2 inches thick. The subsoil is yellowish-red silty clay that extends to a depth of about 32 inches. The substratum is stratified loam and silty clay loam that has colors in shades of red, brown, and gray.

Representative profile of Luverne loam, 1 1/2 miles west of Bethlehem, approximately 330 feet east of church and north of local road, SW1/4 NE1/4 NW1/4 sec. 18, T. 6 S., R. 1 W.:

Ap--0 to 2 inches, brown (10YR 4/3), yellowish-brown (10YR 5/4), and dark yellowish-brown (10YR 4/4) loam; weak, fine, granular structure; very friable; many fine and coarse roots; many, fine and coarse, soft fragments of ferruginous rock; very strongly acid; abrupt, smooth boundary.

A&B--2 to 4 inches, mottled yellowish-red (5YR 5/8) and yellowish-brown (10YR 5/4) sandy clay loam; weak, medium, subangular blocky structure; friable; many fine and coarse roots; common, fine and coarse, ferruginous rocks; very strongly acid; gradual, smooth boundary.

B21t--4 to 16 inches, yellowish-red (5YR 4/6) silty clay; moderate, medium, subangular blocky structure; friable, slightly plastic; common fine and coarse roots; nearly continuous clay films; few, fine, black and brown stains; very strongly acid; gradual, smooth boundary.

B22t--16 to 29 inches, yellowish-red (5YR 4/6) silty clay; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine and coarse roots; nearly continuous clay films; many fine and coarse fragments of light-gray (10YR 7/2) shale; very strongly acid; gradual, smooth boundary.

B3--29 to 32 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; common medium fragments of light-gray (10YR 7/2) shale; very strongly acid; gradual, smooth boundary.

C1--32 to 41 inches, stratified red (2.5YR 4/8), yellowish-red (5YR 5/8), and light-gray (10YR 7/2) silty clay loam and loam; weak, thin, platy structure; friable; common fragments of light-gray (10YR 7/2) shale; very strongly acid; gradual, smooth boundary.

C2--41 to 48 inches, stratified yellowish-brown (10YR 5/6) and yellowish-red (5YR 5/8) silty clay loam; weak, thin, platy structure; friable, slightly plastic; fragments of light-gray (10YR 7/2) shale; very strongly acid; gradual, smooth boundary.

C3--48 to 54 inches, light-gray (10YR 7/2) silty clay; common, fine and coarse, prominent mottles of red (2.5YR 4/6), yellowish brown (10YR 5/8), and reddish brown (2.5YR 4/4); weak, thin, platy structure; friable, plastic; very strongly acid.

The solum ranges from 20 to 45 inches in thickness. The A1 horizon, where present, is dark grayish brown, grayish brown, or brown. The Ap horizon is silt loam, loam, fine sandy loam, or sandy loam that is brown or dark yellowish brown or has mixed shades of brown and yellow. The A&B horizon, where present, is yellowish-red and yellowish-brown sandy clay loam or loam. The B horizon is red, yellowish-red, or reddish-brown silty clay loam, clay loam, or silty clay. Gray shale fragments occur in the lower part of the B horizon. The upper part of the C horizon is stratified silty clay loam and loam and is red, yellowish red, and yellowish brown. The lower part is mottled light-gray silty clay. Reaction is strongly acid to very strongly acid.

Luverne soils are associated with Cahaba, Lexington, Providence, and Susquehanna soils. They have a more clayey B horizon than the Cahaba, Lexington, and Providence soils. They are better drained than the Susquehanna soils, which have gray mottles in the upper 10 inches of the B horizon.

Luverne complex, 12 to 30 percent slopes, severely eroded (LuE3).--This mapping unit occurs on rough, hilly uplands. It is 60 percent well-drained Luverne loam and 25 percent Lexington, Loring, and Providence soils. The rest is unnamed silty soils and gullies. The soils occur in so intricate a pattern that it is impractical to delineate them separately on the soil map at the scale used.

Runoff is rapid, and the erosion hazard is severe. In much of the acreage the surface layer has been thinned through erosion and is mixed with material

from the upper part of the subsoil. There are spots where all the surface layer and much of the subsoil have been removed through sheet and gully erosion. Rills and shallow gullies are common, and a few deep gullies have formed.

Luverne loam is generally on the hillsides. The surface layer is dark yellowish brown and about 2 inches thick. The subsoil is yellowish-red silty clay loam to silty clay about 28 inches thick. The substratum, below a depth of 30 inches, is stratified silty clay loam and loam and has shades of red, brown, and gray. Reaction is strongly acid to very strongly acid. The available water capacity is high, and permeability is moderately slow.

Because slopes are steep and the erosion hazard is severe, this complex is suited only to pine trees and pasture. Most of the acreage is woodland. (Capability unit VIIe-3; woodland group 4c2)

Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded (LvE3).--This mapping unit occurs on rough, wooded, hilly uplands. It is about 36 percent well-drained Luverne loam and 31 percent somewhat poorly drained Susquehanna silt loam. The rest is mainly Cascilla, Lexington, Providence, and Vicksburg soils. The soils occur without much regularity of pattern. Runoff is rapid, and erosion is a severe hazard. The surface layer has been thinned through erosion and is mixed with subsoil material. Rills, shallow gullies, and a few deep gullies have formed in most areas.

Luverne loam has the profile described as representative for the series. Reaction is strongly acid to very strongly acid. The available water capacity is high, and permeability is moderately slow.

Susquehanna silt loam has a mixed brown and very dark grayish-brown surface layer about 2 inches thick. The subsoil is strong-brown to red silty clay and clay mottled with gray in the upper part. At a depth of about 25 inches, the subsoil is clay mottled with shades of gray, brown, red, and yellow. Reaction is strongly acid to very strongly acid. The available water capacity is high, and the permeability is very slow.

Because slopes are strong and the erosion hazard is severe, these soils are suited only to pine trees and to pasture. (Capability unit VIIe-3; woodland group 4c2)

Luverne-Susquehanna association, hilly (LSF).--This association occurs on rough, wooded, hilly uplands. It is about 40 percent well-drained Luverne loam and 35 percent somewhat poorly drained Susquehanna silt loam. The rest is mainly Cahaba and Providence soils on uplands and Arkabutla and Ochlockonee soils on the flood plains. This unit has been mapped at low intensity. The composition is more variable than that of most mapping units in the survey area, but has been controlled well enough to interpret for the expected use of the soils. Slopes range from 12 to 30 percent, and runoff is rapid.

Luverne loam has a brown and yellowish-brown surface layer about 4 inches thick. The subsoil, about 26 inches thick, is yellowish-red silty clay. The substratum is stratified silty clay loam and loam and has shades of red, brown, and gray. Reaction is strongly acid to very strongly acid. The available water capacity is high, and the permeability is moderately slow.

Susquehanna silt loam has a brown surface layer about 3 inches thick. The subsoil is red clay mottled with gray to a depth of about 28 inches. The lower part of the subsoil is clay mottled with shades of gray, brown, yellow, and red. Reaction is strongly acid to very strongly acid. The available water capacity is high, and the permeability is very slow.

Because slopes are strong and the erosion hazard is severe, this association is suited only to trees and permanent vegetation. Most of it is woodland. (Capability unit VIIe-4; woodland group 4c2)

Memphis Series

The Memphis series consists of well-drained soils on uplands.

Typically, the surface layer is dark-brown silt loam about 5 inches thick. The subsoil is dark-brown silty clay loam to a depth of about 30 inches. Below this, it is dark-brown or reddish-brown silt loam.

Representative profile of Memphis silt loam, 2 to 5 percent slopes, eroded, approximately 5 miles southwest of Holly Springs, 1/4 mile south of Mississippi Highway 4, and 125 feet west of a dwelling, NE1/4 NW1/4 SW1/4 sec. 35, T. 4 S., R. 3 W.:

Ap--0 to 5 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; common fine roots; medium acid; abrupt, smooth boundary.

B21t--5 to 12 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine roots; continuous clay films; few, fine and medium, black stains; strongly acid; clear, wavy boundary.

B22t--12 to 30 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine roots; continuous clay films; common, medium, distinct, black stains; strongly acid; clear, wavy boundary.

B23t--30 to 39 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium, subangular blocky structure; friable; patchy clay films; light yellowish-brown silt coatings on peds and in cracks; common, medium, distinct, black stains; strongly acid; clear, wavy boundary.

B24t--39 to 56 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium, subangular blocky structure; friable; patchy clay films on ped faces; light yellowish-brown silt coatings on

peds and in cracks; common, medium, distinct, black stains; strongly acid; clear, wavy boundary.

B3--56 to 72 inches, reddish-brown (5YR 4/4) silt loam; weak, medium and coarse, subangular and angular blocky structure; friable; patchy clay films on ped faces; light yellowish-brown silt coatings on peds and in cracks; strongly acid; clear, wavy boundary.

Where present, the A1 horizon is thin and very dark grayish brown or dark grayish brown to grayish brown. The Ap horizon is brown, dark-brown, or yellowish-brown silt loam or silty clay loam. The upper part of the B2 horizon is dark-brown, brown, or strong-brown silty clay loam or silt loam and the lower part is dark-brown, reddish-brown, or yellowish-red silt loam. Reaction is medium acid to strongly acid, except where the soil has been limed.

Memphis soils are associated with Calloway, Grenada, Henry, Lexington, Loring, and Providence soils. They lack the fragipan typical of Calloway, Grenada, and Henry soils, and are better drained. They are less sandy in the lower part of the B horizon than Lexington soils. They lack the fragipan typical of the Loring and Providence soils.

Memphis silt loam, 0 to 2 percent slopes (MeA).--This is a well-drained soil on ridgetops. The surface layer is yellowish-brown silt loam about 8 inches thick. The upper 27 inches of the subsoil is brown silty clay loam. The lower part is brown silt loam. Reaction is medium acid to strongly acid. Permeability is moderate, and the available water capacity is very high. Runoff is slow, and erosion is a slight hazard where this soil is cultivated. Included in mapping are small areas of Lexington, Loring, and Grenada silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, truck crops, and pasture plants. It can be cultivated every year, and many kinds of cropping systems are suitable. Crop residue shredded and left on the surface as a mulch helps to maintain tilth and increase water infiltration. Surface water can be controlled easily by grading crop rows. Most of the acreage is used for row crops or pasture. (Capability unit I-2; woodland group 1o7)

Memphis silt loam, 2 to 5 percent slopes, eroded (MeB2).--This is a well-drained soil on ridgetops. It has the profile described as representative for the series. Reaction is medium acid to strongly acid. Permeability is moderate, and the available water capacity is very high.

Runoff is slow to medium, and the erosion hazard is slight to moderate where the soil is cultivated. Rills and shallow gullies have formed in some fields. In places the surface layer has been thinned through erosion and is mixed with subsoil material. Included in mapping are small areas of Grenada, Lexington, and Loring silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, truck crops, pasture plants, adapted hardwoods, and loblolly and shortleaf pines. Cultivated crops that leave a large amount of residue can be grown year after year if the fields are terraced, cultivated on the contour, properly tilled, and adequately fertilized and if waterways are grassed. Tilth can be maintained by proper use of crop residue. Most of the acreage is cultivated or used for pasture. The rest is woodland. (Capabilty unit IIe-1; woodland group 1o7)

Memphis silt loam, 5 to 8 percent slopes, severely eroded (MeC3).--This is a well-drained soil on ridgetops and hillsides. The surface layer is yellowish-brown silt loam about 3 inches thick. The subsoil, to a depth of about 27 inches, is brown silty clay loam. Below this it is brown silt loam. Reaction is medium acid to strongly acid. Permeability is moderate, and the available water capacity is very high.

Runoff is medium to rapid, and the erosion hazard is severe where this soil is cultivated. In most of the acreage the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are many spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the upper subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Grenada, Lexington, and Loring silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, truck crops, and pasture plants, and to loblolly and shortleaf pines. Where this soil is used for cultivated crops, terracing, contour cultivation, and planting grasses and legumes in the cropping system are needed to control erosion. Tilth can be maintained by proper use of crop residue. Most of the acreage is used for cultivated crops or pasture. (Capability unit IIIe-1; woodland group 3o2)

Ochlockonee Series

The Ochlockonee series consists of well-drained soils on flood plains.

Typically, the surface layer is dark-brown sandy loam about 3 inches thick. Below this is dark-brown sandy loam and fine sandy loam.

Representative profile of Ochlockonee sandy loam, 3/4 mile south of Mount Pleasant, 660 feet west of Highway 311, and 330 feet south of Little Coldwater Creek, SW1/4 NE1/4 NE1/4, sec. 4, T. 2 S., R. 3 W.:

Ap--0 to 3 inches, dark-brown (10YR 4/3) sandy loam; common, medium, faint, brown mottles; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

C1--3 to 21 inches, dark-brown (7.5YR 4/4) sandy loam; structureless; very friable; common fine roots; thin bedding planes; strongly acid; abrupt, smooth boundary.
C2--21 to 30 inches, dark-brown (7.5YR 4/4) fine sandy loam; structureless; very friable; few fine roots; thin bedding planes; strongly acid; abrupt, smooth boundary.
C3--30 to 52 inches, dark-brown (7.5YR 4/4) sandy loam; structureless; very friable; few fine roots; bedding planes; strongly acid.

The Ap horizon ranges from dark brown, brown, and strong brown to dark yellowish brown and yellowish brown. Where present, the A1 horizon is thin and dark grayish brown, grayish brown, or dark brown. The C horizons are sandy loam, fine sandy loam, loam, or silt loam and range in color from brownish yellow to yellowish brown, dark brown, brown, or strong brown. The C horizons have thin bedding planes, especially in the upper 20 inches, and are mottled in places with shades of gray below a depth of 20 inches. Reaction is strongly acid to very strongly acid, except where the soil has been limed.

Ochlockonee soils are associated with Bruno, Collins, Falaya, and Vicksburg soils. They are less sandy between depths of 10 and 40 inches than the Bruno soils. They are better drained than the Collins and Falaya soils and have more sand between depths of 10 and 40 inches. They have more sand between depths of 10 and 40 inches than the Vicksburg soils.

Ochlockonee sandy loam (Oc).--This is a well-drained soil on flood plains. Reaction is strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is moderate. Slopes are 0 to 2 percent, and runoff is slow. Most areas are subject to flooding for short periods, but crops are seldom damaged. Included in mapping are small areas of Bruno, Cascilla, and Vicksburg soils.

This is one of the best soils for farming in the county. It is well suited to cotton, corn, soybeans, small grains, and truck crops if well managed. It is also well suited to pasture and to hardwood and pine trees.

If adequately fertilized and properly tilled, this soil can be used continuously for cultivated crops that leave a large amount of residue. Tilth can be maintained by proper use of crop residue. (Capability unit I-1; woodland group 1o7)

Providence Series

The Providence series consists of moderately well drained soils that have a fragipan. These soils occur on uplands.

Typically, the surface layer is dark yellowish-brown silt loam about 3 inches thick. The upper part of the subsoil is dark-brown silty clay loam that extends to a depth of 26 inches. Below this is a silt loam fragipan that is dark brown mottled with light brownish gray and shades of brown. Below a depth of 40 inches the pan is strong-brown silt loam and loam mottled with light brownish gray and yellowish brown.

Representative profile of Providence silt loam, 2 to 5 percent slopes, eroded, 2 3/4 miles south of Holly Springs, 100 feet west of Mississippi Highway 7 and approximately 300 feet south of dwelling and 300 feet west of drive, NE1/4 SE1/4 SE1/4 sec. 13, T. 4 S., R. 3 W.:

Ap--0 to 3 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; few fine roots; strongly acid; abrupt, smooth boundary.
B21t--3 to 14 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable, slightly plastic; few fine roots; patchy clay films; few black and brown stains; very strongly acid; clear, smooth boundary.
B22t--14 to 26 inches, dark-brown (7.5YR 4/4) silty clay loam; few, fine, distinct, pale-brown mottles; friable; few fine roots; patchy clay films; few pale-brown silt coatings; few black and brown stains; very strongly acid; clear, smooth boundary.
Bx1--26 to 40 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct mottles of light brownish gray (10YR 6/2), pale brown (10YR 6/3), and yellowish brown (10YR 5/6); moderate, medium, subangular blocky structure; firm, compact and brittle; few patchy clay films; few fine voids; silt coatings in polygonal cracks; few, fine, black and brown stains; very strongly acid; clear, smooth boundary.
IIBx2--40 to 50 inches, strong-brown (7.5YR 5/6) silt loam; few, fine, distinct mottles of light brownish gray and yellowish brown; moderate, medium, angular and subangular blocky structure; firm, compact and brittle; few patchy clay films; few fine voids; silt coatings in polygonal cracks; few black and brown stains; very strongly acid; clear, smooth boundary.
IIBx3--50 to 60 inches, strong-brown (7.5YR 5/6) loam; few, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, angular and subangular blocky structure; firm, compact and brittle; few patchy clay films; few fine voids; very strongly acid.

The Ap horizon ranges from brown to dark brown, dark yellowish brown, or yellowish brown. Where present, the A1 horizon is thin and is very dark grayish brown, dark grayish brown, or grayish brown.

The B2 horizon, above the fragipan, is dark-brown, brown, strong-brown, reddish-brown, or yellowish-brown silty clay loam or silt loam. The Bx horizon is dark brown, yellowish brown, strong brown, reddish yellow, or yellowish red mottled with shades of gray and brown. In places the Bx horizon is mottled with shades of brown, gray, red, and yellow. The upper part of the Bx horizon is silt loam or silty clay loam. The lower part is silt loam, loam, sandy loam, silty clay loam, or sandy clay loam. In places, a IIB horizon of silty clay or clay is below the Bx horizon; it has similar colors. Reaction is strongly acid to very strongly acid, except where the soil has been limed.

Providence soils are associated with Cahaba, Grenada, Lexington, Loring, Luverne, and Memphis soils. They differ from Cahaba soils in having a less sandy B horizon and a fragipan. They differ from Lexington and Memphis soils in having a fragipan. They have more sand in the lower part of the Bx horizon than Loring soils. They differ from Grenada soils in having a Bt horizon above the fragipan. They differ from Luverne and Susquehanna soils in having a less clayey B horizon and a fragipan.

Providence silt loam, 2 to 5 percent slopes, eroded (PoB2).--This is a moderately well drained soil on ridgetops. It has the profile described as representative for the series. Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate.

Runoff is slow to medium. The erosion hazard is slight to moderate in cultivated areas, and rills have formed in some fields. In places the surface layer has been thinned through erosion and is mixed with subsoil material. Included in mapping are small areas of Lexington and Loring silt loams.

This soil is suited to cotton, corn, soybeans, small grains, and pasture and to trees. If management includes terraces, contour cultivation, grass waterways, proper tillage, and adequate fertilization, crops that leave large amounts of residue can be grown year after year. (Capability unit IIe-2; woodland group 2o7)

Providence silt loam, 5 to 8 percent slopes, severely eroded (PoC3).--This is a moderately well drained soil on ridgetops and hillsides. The surface layer is dark yellowish-brown silt loam about 2 inches thick. The upper part of the subsoil is brown silty clay loam about 16 inches thick. Below this is a strong-brown silt loam fragipan mottled with shades of yellow and gray. Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate.

Runoff is medium to rapid, and the erosion hazard is severe in cultivated areas. In most of the acreage the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are areas where the surface layer and much of the upper part of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Lexington and Loring silt loams.

This soil is well suited to cotton, corn, soybeans, small grains, and pasture plants and to loblolly pine or shortleaf pine. It is best suited to permanent pasture or trees. If terracing and contour cultivation are practiced, row crops can be grown in a cropping system that includes grasses and legumes. Proper use of crop residue preserves tilth. Most of the acreage is used for row crops and pasture. (Capability unit IVe-1; woodland group 3o2)

Providence silt loam, 8 to 12 percent slopes, severely eroded (PoD3).--This is a moderately well drained soil on hillsides. The surface layer is brown silt loam about 3 inches thick. The upper part of the subsoil is brown silt loam about 15 inches thick. Below this is a brown silt loam and loam fragipan that is mottled with yellow and gray. Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate.

Runoff is rapid, and the erosion hazard is severe in cultivated areas. Permanent cover vegetation is required to control erosion. In most areas the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are many spots where the surface layer and much of the upper part of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Loring and Lexington silt loams.

Strong slopes and the erosion hazard limit the use of this soil mainly to pasture and to loblolly pine or shortleaf pine. Approximately three-fourths of the acreage is in pasture. A few small areas are cultivated. The rest is woodland. (Capability unit VIe-1; woodland group 3o2)

Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded (PrB2).--This is a moderately well drained soil on ridgetops. The surface layer is grayish-brown silt loam 4 inches thick. The upper 17 inches of the subsoil is strong-brown silt loam. The upper 7 inches of the fragipan is yellowish-brown silt loam mottled with dark brown; the lower 18 inches is silty clay loam mottled with shades of red, brown, yellow, and gray. Below a depth of 45 inches is yellowish-red silty clay mottled with very pale brown. Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate.

Runoff is slow to medium. The erosion hazard is slight in cultivated areas, but rills have formed in some fields. In places the surface layer has been thinned through erosion and is mixed with material from the upper part of the subsoil. Included in mapping are small areas of Providence silt loam.

This soil is well suited to cotton, corn, soybeans, small grains, and pasture plants, and to loblolly and shortleaf pines and hardwoods. If management includes terraces, contour cultivation, grass waterways, proper tillage, and adequate fertilization, crops that leave large amounts of residue can be grown year after year. Approximately half the acreage is used for pasture and cultivated crops. The rest is woodland. (Capability unit IIe-2; woodland group 2o7)

Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded (PrC3).--This is a moderately well drained soil on ridgetops and hillsides.

Representative profile of Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded, 1 mile south and 2 1/4 miles west of Bethlehem near local road, approximately 175 feet north of farm house, SW1/4 SE1/4 SW1/4 sec. 13, T. 6 S., R. 2 W.:

Ap--0 to 3 inches, dark-brown (7.5YR 4/4) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21t--3 to 11 inches, strong-brown (7.5YR 5/6) silt loam; moderate, medium, subangular blocky structure; friable; few fine roots; clay films on ped faces; strongly acid; clear, wavy boundary.

B22t--11 to 16 inches, strong-brown (7.5YR 5/6) silt loam; common, medium, faint, dark-brown (7.5YR 4/4) mottles; moderate, medium, subangular and angular blocky structure; friable; clay films on ped faces; strongly acid; clear, wavy boundary.

Bx1--16 to 23 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, faint, dark-brown (7.5YR 4/4) mottles; moderate, medium, angular blocky structure; compact and brittle, firm; gray silt coatings between peds; common, coarse, black stains on ped faces; clay films on ped faces; strongly acid; clear, wavy boundary.

Bx2--23 to 35 inches, reddish-yellow (7.5YR 6/6) silty clay loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, angular blocky structure; compact and brittle, firm; clay films on ped faces; strongly acid; clear, wavy boundary.

Bx3--35 to 41 inches, mottled yellowish-red (5YR 5/6) and light brownish-gray (10YR 6/2) silty clay loam; moderate, medium and coarse, angular blocky structure; slightly compact and brittle, firm; clay films on ped faces; strongly acid; clear, wavy boundary.

IIBt--41 to 54 inches, yellowish-red (5YR 4/6) silty clay; common, medium, distinct mottles of very pale brown (10YR 7/3); moderate, medium and coarse, subangular blocky structure; plastic, sticky; few slickensides less than 2 inches long in lower part of horizon; few patchy clay films; strongly acid.

Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate.

Runoff is medium to rapid, and the erosion hazard is severe in cultivated areas. In most areas the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are many spots where the surface layer and much of the upper part of the subsoil have been lost through sheet and gully erosion. Included in mapping are small areas of Providence silt loam.

This soil is well suited to cotton, corn, soybeans, small grains, and pasture plants, and to loblolly and shortleaf pines and hardwoods. It is best suited to permanent pasture or woodland. If terracing and contour cultivation are practiced, row crops can be grown in a cropping system that includes grasses and legumes. Most of the acreage is used for cultivated crops or pasture. Part is woodland. (Capability unit IVe-1; woodland group 3o2)

Providence silt loam, heavy substratum, 8 to 12 percent slopes, severely eroded (PrD3).--This is a moderately well drained soil on hillsides. The surface layer is about 2 inches thick. The upper 16 inches of the subsoil is strong-brown silt loam. Below this is a fragipan of mottled brown, yellow, red, and gray silty clay loam. Below a depth of 40 inches is yellowish-red silty clay mottled with brown. Reaction is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate.

Runoff is rapid, and the erosion hazard is severe. In most areas the surface layer has been thinned through erosion. Rills and shallow gullies are common, and a few deep gullies have formed. There are many spots, as much as 20 feet wide and 60 feet long, where the surface layer and much of the subsoil have been removed through sheet and gully erosion. Included in mapping are small areas of Providence silt loam.

Because slopes are strong and the erosion hazard is severe, this soil is best suited to pine trees and permanent pasture. Commonly grown pasture plants and loblolly and shortleaf pines are suitable. Approximately one-fourth of the acreage is used for pasture. The rest is woodland. (Capability unit VIe-1; woodland group 3o2)

Providence-Cahaba complex, 12 to 30 percent slopes (PvE).--This complex occurs on rough, hilly uplands. It is about 33 percent Providence silt loam and 26 percent Cahaba loam. The rest is mainly Lexington, Memphis, Ochlockonee, and Vicksburg soils. The landscape is one of narrow winding ridgetops and moderately steep side slopes that are broken by numerous short drainageways. The soils are so intermingled it is impractical to map them separately.

Providence silt loam occurs on narrow ridgetops and the upper part of side slopes. It is moderately

well drained. The surface layer is dark grayish brown and about 3 inches thick. Below this is yellowish-brown silt loam that extends to a depth of about 8 inches. The subsoil is dark-brown silty clay loam. A fragipan is at a depth of about 24 inches. It is brown mottled with yellow and gray. The upper part of the pan is silt loam and the lower part is sandy loam. Reaction is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate. Runoff is rapid to very rapid.

Cahaba loam occurs on the middle and lower parts of side slopes. It is well drained. The surface layer is dark brown and yellowish brown and about 3 inches thick. The subsoil is reddish-brown sandy clay loam about 30 inches thick. Below this is red sandy loam. This soil is strongly acid or very strongly acid. Permeability is moderate, the available water capacity is moderate, and runoff is rapid.

Because slopes are moderately steep and the erosion hazard is severe, this unit is best suited to hardwoods and pine trees or to permanent pasture. Practically all of the acreage is in pine forest. (Capability unit VIIe-1; woodland group 3r7)

Providence-Cahaba association, hilly (PCF).--This association is about 51 percent Providence silt loam and 29 percent Cahaba loam. The rest is mainly excessively drained and well-drained sandy soils and moderately well drained unnamed soils. This association has been mapped at low intensity. The composition is more variable than that of most mapping units in the county, but has been controlled well enough to interpret for the expected uses of the soils. The landscape is one of narrow winding ridgetops and moderately steep, choppy side slopes that are dissected by numerous short drainageways. Slopes range from 12 to 30 percent, and runoff is rapid.

Providence silt loam is on ridgetops and the upper part of side slopes. It is moderately well drained. The surface layer is grayish brown and is about 2 inches thick. The subsoil is brown silty clay loam about 15 inches thick. This is underlain by a fragipan that is brown mottled with yellow and gray. The upper part of the fragipan is silt loam, and the lower part is sandy loam. Reaction is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is moderate.

Cahaba loam is on the middle and lower parts of side slopes. It is well drained. The surface layer is dark brown. The subsurface layer is yellowish-brown loam that extends to a depth of 6 inches. The subsoil is reddish-brown sandy clay loam about 25 inches thick. The substratum is red sandy loam. Reaction is strongly acid to very strongly acid. Permeability and the available water capacity are moderate.

This association is suited to hardwoods and pines and to permanent pasture. Most of the acreage is in mixed pine forest. (Capability unit VIIe-1; woodland group 3r7)

Rosebloom Series

The Rosebloom series consists of poorly drained soils in depressed areas on flood plains. In this county, Rosebloom soils are mapped only with Arkabutla soils.

Typically, the surface layer is dark grayish-brown silt loam about 4 inches thick. The subsoil is mottled light brownish-gray, pale-brown, and brown silty clay loam to a depth of 8 inches. Below a depth of 8 inches it is light brownish-gray and gray silty clay loam mottled with yellowish brown.

Representative profile of Rosebloom silt loam, approximately 1 mile south and 2 miles west of Cornersville, sec. 35, T. 6 S., R. 1 W.:

A1--0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

B1g--4 to 8 inches, mottled light brownish-gray (10YR 6/2), pale-brown (10YR 6/3), and brown (10YR 5/3) silty clay loam; weak, fine, subangular blocky structure; friable, slightly plastic; few fine roots; strongly acid; clear, smooth boundary.

B22g--8 to 20 inches, light brownish-gray (10YR 6/2) heavy silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; gradual, smooth boundary.

B23g--20 to 48 inches, gray (10YR 6/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; slightly plastic; strongly acid.

The A1 horizon is very dark grayish-brown, dark grayish-brown, or grayish-brown silt loam. The Ap horizon is grayish-brown, dark grayish-brown, or brown silt loam. The B horizon is gray or light brownish-gray silt loam or silty clay loam mottled with shades of brown and yellow. Reaction is strongly acid to very strongly acid, except where the soil has been limed.

Rosebloom soils are associated with Arkabutla, Collins, Falaya, and Vicksburg soils. They have dominantly grayish colors to a depth of 30 inches whereas Arkabutla soils have brown colors. They are more than 18 percent clay between depths of 10 and 40 inches whereas Collins, Falaya, and Vicksburg soils are less than 18 percent clay and are better drained.

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained soils on uplands. In this county, Susquehanna soils are mapped only with Luverne soils.

Typically, the surface layer is brown and very dark grayish-brown silt loam about 2 inches thick. The subsurface layer is yellowish-brown silty clay loam. The upper 19 inches of the subsoil is strong-brown to red silty clay and clay mottled with gray. The subsoil, below a depth of 25 inches, is clay mottled with shades of gray, brown, and red.

Representative profile of Susquehanna silt loam, 1 mile northwest of intersection of local road and Mississippi Highway 349, approximately 1/2 mile north of Bethlehem, SW1/4 NW1/4 SW1/4 sec. 4, T. 6 S., R. 1 W.:

A1--0 to 2 inches, brown (10YR 5/3) and very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

A2--2 to 6 inches, yellowish-brown (10YR 5/4) silty clay loam; weak, fine, granular and subangular blocky structure; friable; few fine roots; strongly acid; abrupt, smooth boundary.

B21t--6 to 17 inches, strong-brown (7.5YR 5/6) silty clay; common, medium, faint and distinct, yellowish-red (5YR 5/6) and light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; firm, plastic; few fine roots; continuous clay films; strongly acid; gradual, smooth boundary.

B22t--17 to 25 inches, red (2.5YR 4/8) clay; many, coarse, prominent, gray (10YR 6/1) mottles; moderate, medium, subangular and angular blocky structure; firm, plastic; few fine roots; continuous clay films; very strongly acid; gradual, smooth boundary.

B23t--25 to 36 inches, mottled yellowish-brown (10YR 5/6) and gray (10YR 5/1) clay; moderate, medium, subangular and angular blocky structure; firm, plastic; few fine roots; nearly continuous clay films; very strongly acid; gradual, smooth boundary.

B24t--36 to 43 inches, mottled light brownish-gray (2.5Y 6/2) and gray (10YR 6/1) clay; moderate, medium, subangular and angular blocky structure; firm, plastic; nearly continuous clay films; very strongly acid; gradual, smooth boundary.

B25t--43 to 58 inches, gray (10YR 6/1) clay; few, fine and medium, distinct, strong-brown (7.5YR 5/6) and yellowish-red (5YR 5/6) mottles; strong, medium, angular blocky structure; firm, plastic; clay films on peds; common slickensides; very strongly acid.

The A1 horizon is very dark grayish-brown, dark grayish-brown, grayish-brown, or brown silt loam, loam, or fine sandy loam. The A2 horizon is yellowish-brown, brown, or strong-brown loam or silty clay loam. The upper part of the B2 horizon is strong brown, reddish brown, yellowish red, or red mottled with shades of gray and red. The lower part is mottled with shades of gray, brown, yellow, and red or has dominantly gray colors mottled with shades of red and brown. The texture is silty clay or clay. Reaction is strongly acid to very strongly acid.

Susquehanna soils are associated with Cahaba, Luverne, and Providence soils. They have a more clayey B horizon and a thicker solum than the Cahaba and Providence soils. They lack the fragipan typical of the Providence soils. They have a thicker solum than Luverne soils, are more mottled, and are not so well drained.

Swamp

Swamp (Sw) occurs in depressed areas on flood plains that are covered with fresh water from underground springs. The soil material is silty and sandy alluvial sediments. Water rushes, sedges, and water-tolerant grasses and trees grow in most areas. Swamp is suited only to wildlife habitat. (Capability unit VIIw-1; not assigned to a woodland group)

Vicksburg Series

The Vicksburg series consists of well-drained soils on flood plains.

Typically, the surface layer is dark yellowish-brown silt loam about 6 inches thick. Below this is brown, dark-brown, and dark yellowish-brown silt loam that extends to a depth of 60 inches or more.

Representative profile of Vicksburg silt loam, 1 mile north of Galena, 150 feet south of Mississippi Highway 4, and 100 feet west of creek, NE1/4 NE1/4 NE1/4 sec. 5, T. 5 S., R. 3 W.:

Ap--0 to 6 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

C1--6 to 23 inches, dark yellowish-brown (10YR 4/4) silt loam; structureless; very friable; bedding planes; few fine roots; strongly acid; clear, smooth boundary.

C2--23 to 31 inches, brown (10YR 4/3) silt loam; common, fine, faint, yellowish-brown mottles; structureless; very friable; bedding planes; strongly acid; clear, smooth boundary.

C3--31 to 44 inches, dark-brown (10YR 3/3) silt loam; structureless; very friable; bedding planes; strongly acid; clear, smooth boundary.

C4--44 to 61 inches, mottled brown (10YR 5/3) and yellowish-brown (10YR 5/4) silt loam; structureless; very friable; strongly acid.

The Ap horizon is brown, strong-brown, dark yellowish-brown, or yellowish-brown silt loam. Where present, the A1 horizon is thin, dark grayish-brown, grayish-brown, or dark-brown silt loam. The C

horizon is yellowish brown, dark yellowish brown, brown, dark brown, or strong brown. Thin bedding planes occur in the C horizon. Mottles in shades of gray occur in some areas below a depth of 20 inches. Reaction is very strongly acid to strongly acid throughout, except where the soil has been limed.

Vicksburg soils are associated with Arkabutla, Cascilla, Collins, Falaya, Ochlockonee, and Rosebloom soils. They lack the B horizon typical of Arkabutla and Rosebloom soils and are less clayey between depths of 10 and 40 inches. They lack the B horizon typical of Cascilla soils. They are better drained than the Collins and Falaya soils. They have less sand between depths of 10 and 40 inches than the Ochlockonee soils.

Vicksburg silt loam (Va).--This is a well-drained soil on flood plains. It has the profile described as representative for the series. Reaction is strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is very high. Slopes are 0 to 2 percent, and runoff is slow. Most areas are subject to occasional flooding for short periods, but crops seldom are damaged. Included in mapping are small areas of Arkabutla, Cascilla, Collins, and Falaya soils.

This is one of the best soils for farming in the county. It is suited to cotton, corn, soybeans, truck crops, and small grains, if management is good. It is well suited to hardwood trees and to pasture. If adequately fertilized and properly tilled, this soil can be used continuously for cultivated crops that leave a large amount of residue. Tilth can be maintained by proper use of crop residue. In some areas surface drainage is needed. (Capability unit I-1; woodland group 1o7)

Vicksburg and Ochlockonee soils (Vo).--This mapping unit occurs on flood plains. It is about 60 percent well-drained Vicksburg silt loam and 25 percent well-drained Ochlockonee sandy loam. The rest is mainly Bruno, Cascilla, Collins, and Falaya soils. Slopes range from 0 to 2 percent, and runoff is slow.

Vicksburg silt loam occurs on and near the natural levees of streams. The surface layer is yellowish brown and about 6 inches thick. Below this is yellowish-brown and dark yellowish-brown silt loam. Reaction is strongly acid to very strongly acid. The available water capacity is very high, and the permeability is moderate.

Ochlockonee sandy loam occurs on natural levees of streams and on alluvial fans. The surface layer is dark brown and about 5 inches thick. Below this are thick layers of dark-brown fine sandy loam and sandy loam. Reaction is strongly acid to very strongly acid. The available water capacity is moderate, and the permeability is moderate.

These soils are well suited to cotton, corn, truck crops, soybeans, and small grains, if management is good. They also are well suited to hardwood trees and to pasture. If adequately fertilized and properly tilled, these soils can be used continuously for cultivated crops that leave a large amount of residue. Most of the acreage is used for cultivated crops or pasture. The rest is hardwood forest. (Capability unit I-1; woodland group 1o7)

About half the acreage in Marshall County is used for crops and pasture. The major crops are cotton, corn, soybeans, and wheat, but truck crops are grown in a few areas. The acreage used for beef cattle and dairy farming is increasing.

Maintaining fertility and controlling erosion are the two main problems in managing the soils for crops and pasture.

Most crops require nitrogen fertilizer, and some need phosphate and potash. Lime also is needed for legumes and some other crops. Information about the kinds and amount of fertilizer to apply can be obtained from the local representative of the Soil Conservation Service.

Erosion is a severe hazard in most cultivated areas. The degree of this hazard depends on the steepness of slopes, the texture, structure, and permeability of the soil, and the amount of cover vegetation. Water erosion can be controlled by terracing and contour stripcropping, by planting cover crops in waterways, in drainage outlets, and in exposed areas, and by establishing terraces to divert runoff. Other helpful practices are utilizing crop residues, keeping tillage to a minimum, and installing drains and other water-control structures where needed.

Suitable crops and management for each mapping unit are discussed in the section "Descriptions of the Soils." A nationwide system of classification is used for rating the suitability of the soils for crops. This system is explained in the following paragraphs.

Capability Grouping

Some readers, particularly those who practice large-scale farming, may find it practical to use and manage alike some of the different kinds of soils on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, all kinds of soils are grouped at three levels: the capability class, subclass, and unit. These are discussed in the following paragraphs.

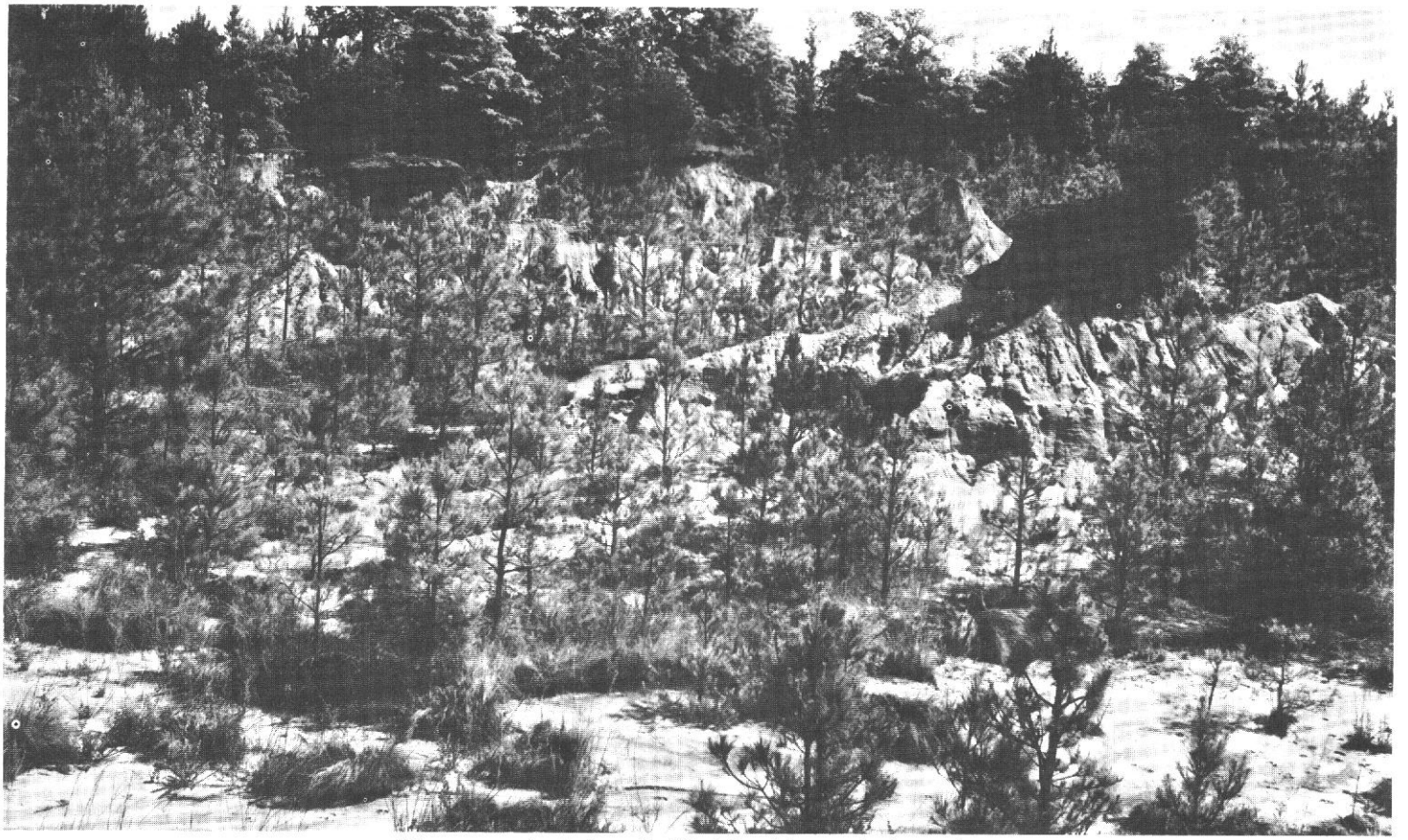
CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

- Class I soils have few limitations that restrict their use.
- Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife. (None in Marshall County)
- Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.
- Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.
- Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Marshall County)

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by w, s, and c, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a



Pines are planted on Gullied land to control erosion.

Nursery shrubs on Calloway and Henry silt loams.

Stand of pine 20 years old. Many parts of the county have been reforested.

Dug pond provides water for livestock.

convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IIe-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

The capability classes, subclasses, and units in Marshall County are given in the following outline. The unit designation for each soil is given in the "Guide to Mapping Units."

Class I. Soils that have few limitations that restrict their use.
- Unit I-1. Well-drained, nearly level soils on flood plains.
- Unit I-2. Well-drained, nearly level soils on uplands.

Class II. Soils that have some limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe-1. Well-drained soils that have slopes of 2 to 5 percent.
  - Unit IIe-2. Moderately well drained soils that have slopes of 2 to 5 percent.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw-1. Moderately well drained and somewhat poorly drained, nearly level soils on flood plains.
  - Unit IIw-2. Moderately well drained, nearly level soils on uplands.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-1. Well-drained soils that have slopes of 5 to 8 percent.
- Subclass IIIw. Soils that have severe limitations because of excess water.
  - Unit IIIw-1. Somewhat poorly drained soils that have slopes of 0 to 5 percent.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.
- Subclass IVe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IVe-1. Moderately well drained and well drained, severely eroded soils that have slopes of 5 to 8 percent.
- Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.
  - Unit IVw-1. Poorly drained soils on uplands.
  - Unit IVw-2. Poorly drained to excessively drained soils subject to severe damage from flooding.

Class V. Soils that are not likely to erode, but have other limitations impractical to remove that limit their use largely to pasture, range, woodland, and wildlife. (None in Marshall County)

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture, woodland, or wildlife.
- Subclass VIe. Soils that are severely limited chiefly by the risk of erosion if protective cover is not maintained.
  - Unit VIe-1. Moderately well drained and well drained, severely eroded soils that have slopes of 8 to 12 percent.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation and restrict their use largely to pasture, woodland, or wildlife.
- Subclass VIIe. Soils that are very severely limited chiefly by the risk of erosion if protective cover is not maintained.
  - Unit VIIe-1. Well drained and moderately well drained soils that have slopes of 12 to 30 percent.
  - Unit VIIe-2. Well drained and moderately well drained, severely eroded soils that have slopes of 12 to 30 percent.
  - Unit VIIe-3. Well-drained and somewhat poorly drained, severely eroded soils that have a clayey subsoil and slopes of 12 to 30 percent.
  - Unit VIIe-4. Well-drained and somewhat poorly drained soils that have a clayey subsoil and slopes of 12 to 30 percent.
  - Unit VIIe-5. Well drained and moderately well drained soils that have been altered by very severe gully erosion.
- Subclass VIIw. Soils that have very severe limitations because of excess water.

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Unit VIIw-1. Land covered with varying depths of fresh water which is charged by springs and supports rushes, sedges, water-tolerant grasses, and trees.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plants plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Marshall County)

Estimated Yields

Table 2 shows estimated yields per acre of the principal crops and pasture plants grown in Marshall County under a high level of management. The estimates are for nonirrigated soils in years of average rainfall. They are based on long-term yields of farms that cooperated in studies made by the Mississippi Agricultural Experiment Station, on experience in working with the soils in the county, and on information provided by the Soil Conservation Service and other agricultural agencies in the State. Data obtained from experimental plantings were adjusted to reflect the combined effects of slope, weather, and the level of management.

The following high level of management is needed to obtain the yields listed in the table: (1) applying lime and fertilizer as recommended by the Mississippi Agricultural Experiment Station; (2) planting well-suited crop varieties and hybrids; (3) preparing seedbeds; (4) planting or seeding by suitable methods at recommended rates and at optimum times; (5) inoculating legumes; (6) shallow plowing of row crops; (7) controlling weeds, insects, and diseases; (8) using cropping systems that conserve soil structure and fertility; (9) controlling erosion by land smoothing, sodding waterways, contour cultivation, and contour stripcropping; and (10) protecting pasture from overgrazing.

TABLE 2.--ESTIMATED ACRE YIELDS OF CROPS AND PASTURE PLANTS UNDER HIGH-LEVEL MANAGEMENT

[Absence of yield means data are not available or the crop is not commonly grown on the soil]

Soil	Crops				Pasture				
	Cotton	Corn	Soybeans	Wheat	Common bermudagrass and legume	Bahiagrass and legume	Tall fescue and legume	Dallisgrass and legume	Sericea lespedeza
	Lb.	Bu.	Bu.	Bu.	A.U.M. 1/	A.U.M.	A.U.M.	A.U.M.	A.U.M.
Arkabutla silt loam	675	90	35	35	10.9	---	9.6	11.0	---
Arkabutla-Rosebloom association	---	--	--	30	7.0	7.5	7.5	---	---
Cahaba and Lexington soils, 12 to 30 percent slopes 2/	---	--	--	--	4.0	4.0	---	---	4.0
Cahaba-Lexington association, hilly 2/	---	--	--	--	4.0	4.0	---	---	4.0
Cahaba-Providence complex, 12 to 30 percent slopes, severely eroded	---	--	--	--	4.0	4.0	---	---	---
Calloway silt loam, 0 to 2 percent slopes	575	68	32	32	6.5	6.5	8.0	7.0	5.7
Calloway silt loam, 2 to 5 percent slopes, eroded	550	65	30	30	6.5	6.5	8.0	7.0	5.7
Cascilla silt loam	825	95	40	38	9.0	8.0	8.5	---	---
Collins silt loam	775	95	35	37	9.0	8.0	8.5	11.0	---
Collins-Arkabutla-Bruno association 2/	---	--	--	--	6.0	9.0	8.0	---	---
Collins-Arkabutla-Falaya association 2/	---	--	--	--	8.0	8.0	8.5	11.0	---
Falaya silt loam	650	80	32	35	8.0	8.0	8.5	11.0	---
Grenada silt loam, 0 to 2 percent slopes	650	80	33	35	6.5	6.5	8.0	9.0	5.8

TABLE 2.--ESTIMATED ACRE YIELDS OF CROPS AND PASTURE PLANTS UNDER HIGH-LEVEL MANAGEMENT--Continued

Soil	Crops				Pasture				
	Cotton	Corn	Soybeans	Wheat	Common bermuda-grass and legume	Bahia-grass and legume	Tall fescue and legume	Dallis-grass and legume	Sericea lespedeza
	Lb.	Bu.	Bu.	Bu.	A.U.M. 1/	A.U.M.	A.U.M.	A.U.M.	A.U.M.
Grenada silt loam, 2 to 5 percent slopes, eroded-	625	75	32	31	6.0	6.5	8.0	9.0	5.8
Grenada silt loam, 5 to 8 percent slopes, severely eroded--------	450	45	20	23	5.0	5.0	5.5	---	5.6
Gullied land-Cahaba complex, 5 to 30 percent slopes. Not used for crops or pasture.									
Gullied land-Loring complex, 5 to 30 percent slopes. Not used for crops or pasture.									
Henry silt loam----------	425	42	22	30	6.0	6.2	7.5	---	1.2
Lexington silt loam, 2 to 5 percent slopes, eroded----------	700	78	31	33	6.5	6.5	5.6	8.8	5.6
Lexington silt loam, 5 to 8 percent slopes, severely eroded--------	450	55	22	28	5.5	6.1	6.5	---	---
Lexington silt loam, 8 to 12 percent slopes, severely eroded--------	---	--	--	--	5.0	5.0	6.0	---	---
Loring silt loam, 2 to 5 percent slopes, eroded-	735	80	33	38	6.5	6.5	6.5	9.0	5.8
Loring silt loam, 5 to 8 percent slopes, severely eroded--------	600	60	25	30	5.5	5.5	6.5	---	5.6
Loring silt loam, 8 to 12 percent slopes, severely eroded--------	---	--	--	--	8.0	8.5	---	---	---
Luverne complex, 12 to 30 percent slopes, severely eroded----------	---	--	--	--	3.0	3.0	---	---	3.0
Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded 2/----------	---	--	--	--	3.0	3.0	---	---	3.0
Luverne-Susquehanna association, hilly 2/-------	---	--	---	--	3.0	3.0	---	---	3.0
Memphis silt loam, 0 to 2 percent slopes----------	800	88	36	40	6.5	6.5	8.5	9.5	6.3
Memphis silt loam, 2 to 5 percent slopes, eroded--	750	85	35	38	6.5	6.5	8.0	9.0	5.8
Memphis silt loam, 5 to 8 percent slopes, severely eroded----------	600	65	28	32	5.5	5.5	6.5	---	5.6
Ochlockonee sandy loam----	700	80	32	32	6.0	9.0	8.0	---	---
Providence silt loam, 2 to 5 percent slopes, eroded----------	600	75	30	30	6.0	6.0	8.0	---	---

TABLE 2.--ESTIMATED ACRE YIELDS OF CROPS AND PASTURE PLANTS UNDER HIGH-LEVEL MANAGEMENT--Continued

Soil	Crops				Pasture				
	Cotton	Corn	Soybeans	Wheat	Common bermuda-grass and legume	Bahia-grass and legume	Tall fescue and legume	Dallis-grass and legume	Sericea lespedeza
	Lb.	Bu.	Bu.	Bu.	A.U.M. 1/	A.U.M.	A.U.M.	A.U.M.	A.U.M.
Providence silt loam, 5 to 8 percent slopes, severely eroded	450	45	20	23	5.0	5.0	5.0	---	---
Providence silt loam, 8 to 12 percent slopes, severely eroded	---	--	--	--	5.0	5.0	5.0	---	---
Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	650	75	32	35	6.0	6.0	8.0	---	---
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	450	45	20	23	5.0	5.0	5.0	---	---
Providence silt loam, heavy substratum, 8 to 12 percent slopes, severely eroded	---	--	--	--	4.0	4.0	---	---	5.6
Providence-Cahaba association, hilly 2/	---	--	--	--	4.0	4.0	---	---	4.0
Providence-Cahaba complex, 12 to 30 percent slopes-	---	--	--	--	4.0	4.0	---	---	4.0
Swamp. Not used for crops or pasture.									
Vicksburg silt loam	825	95	40	33	9.0	8.0	8.5	---	---
Vicksburg and Ochlockonee soils 2/	700	80	32	32	6.0	9.0	8.0	---	---

1/ Animal unit month refers to the amount of forage or feed required to maintain 1 animal unit (1 cow, 1 horse, 1 mule, 5 sheep, or 5 goats) for a period of 30 days.

2/ Because the composition of these mapping units is more variable than that of most mapping units in the county, yields may vary more from field to field.

WOODLAND[2/]

In this section the woodland of Marshall County is described and the soils are grouped according to their suitability for trees. Information is given that can be used by woodland owners, foresters, and others in planning tree plantings, in conserving and improving existing stands, and in managing commercial woodlots.

About 47 percent of Marshall County, or 212,200 acres, is woodland. This includes 66,081 acres of mainly loblolly pine in the Yazoo-Little Tallahatchie Flood Prevention Project, and 20,455 acres in the Holly Springs National Forest. The most common species of trees, in order of extent, are red oak, sweetgum, white oak, willow, shortleaf pine, sycamore, hickory, tupelo, blackgum, and white elm. Ash, yellow-poplar, cottonwood, and hackberry are of minor extent.

About 157,100 acres is hardwood forest; of this 103,800 acres is mainly oak and hickory and 53,300 acres is bottom land hardwoods. Bottom land hardwoods are mainly oak, gum, and cypress, and a few isolated stands of elm, ash, and cottonwood.

About 55,100 acres is softwood forest; of this 34,900 acres is loblolly and shortleaf pines and 20,200 acres is mainly mixed oak and pine (pl. II, top). Shortleaf pine is dominant in natural stands. Loblolly pine is virtually absent in natural stands, but pure stands have been planted in most of the Yazoo-Little Tallahatchie Flood Prevention Project.

In 1957, growing stock in the county was about 73.5 million cubic feet, of which 60.7 million was hardwood and 12.8 million was softwood. The volume of sawtimber was 257.2 million board feet, of which 208.1 million was hardwood and 49.1 million was softwood (10). In 1965, about 9,745,000 board feet of sawtimber and 5,019 standard cords of pulpwood were harvested. Current growth of both hardwood and softwood sawtimber exceeds current cuts by at least 10 percent(7).

Six sawmills in Marshall County have an annual output of less than three million board feet each, and one has an annual output of more than three million board feet. Also in the county are one tight cooperage plant, one wood preserving plant, one post buyer, one dipping installation, and two pulpwood dealers (13). Besides contributing substantially to the economy of the county, the woodland provides watershed protection, food and cover for wildlife, and sport and recreation for residents.

Woodland Suitability Groups

The main soil features that affect the growth of trees are texture, depth, and slope. For example, sandy soils, such as those of the Bruno series, have low content of plant nutrients and low available water capacity. Soils that have a clayey subsoil, such as Susquehanna soils, can have high content of plant nutrients and high available water capacity, but their aeration generally is poor, especially during wet periods, and tree roots do not receive adequate oxygen. Practices that increase the content of plant nutrients and prevent compaction generally improve the water capacity and aeration of the soils (12).

The soils of Marshall County have been grouped in table 3 according to their suitability for trees. Each group is made up of soils that are suited to the same kinds of trees, that need approximately the same kind of management when the vegetation on them is similar, and that have about the same potential productivity. In the following paragraphs, the system of suitability grouping is explained and terms used in table 4 are defined.

Each woodland group is identified by a three-part symbol, such as 1o7, 2w8, or 3r2, according to a nationwide system of classification. The first part of the symbol, always a number, indicates the relative potential productivity of the soils in the group: 1= very high; 2= high, 3= moderately high; 4= moderate; and 5= low. Potential production is based on field determination of the average site index of one or more indicator forest types or tree species. Site index is the height, in feet, that the dominant trees in a natural, unmanaged stand on a specified kind of soil reach in a stated number of years. For the merchantable hardwoods and softwoods in this county, the site index is the height reached in 50 years, except for cottonwood, for which the index is height reached in 30 years (3,4,5).

The second part of the symbol identifying a woodland group is a small letter. This letter indicates an important soil property that imposes a moderate or severe hazard or limitation in managing the soils of the group for wood crops. Letter o shows that the soils have few limitations that restrict their use for trees; c shows that the main limitation is the kind or amount of clay in the uppermost layers of the soils in the group; r shows that the main limitation is steep slopes; s shows that the soils are sandy and dry, have low available water capacity, and generally have a low supply of plant nutrients; w shows that water in or on the soil, either seasonally or year round, is the chief limitation.

The third part of the symbol is a number that indicates the degree of hazard or limitation and general suitability of the soils for needleleaf and broadleaf trees.

The numeral 1 indicates soils that have no limitations or only slight limitations and are best suited to needleleaf trees. (None in this county.)

The numeral 2 indicates soils that have one or more moderate limitations and are best suited to needleleaf trees.

The numeral 3 indicates soils that have one or more severe limitations and are best suited to needleleaf trees. (None in this county.)

2/ JOSEPH V. ZARY, forester, helped prepare this section.

TABLE 3.--WOODLAND

[Gullied land (GuE, GvE) and Swamp (Sw) are not

Woodland groups and mapping unit symbols	Potential productivity		Preferred species--
	Tree species	Average site index	In existing stands
Group 1o7: Moderately well drained and well drained soils. Slopes are 0 to 5 percent. Runoff is slow to medium, permeability is moderate, and the available water capacity is moderate to very high. Cm, Co, MeA, MeB2, Oc, Va, Vo.	Green ash Eastern cottonwood Cherrybark oak Nuttall oak Loblolly pine Shortleaf pine Sweetgum	90 110 100 100 90 80 100	Green ash, eastern cottonwood, cherrybark oak, Nuttall oak, southern red oak, water oak, loblolly pine, shortleaf pine, sassafras, sweetgum, yellow-poplar.
Group 1w8: Nearly level, somewhat poorly drained to moderately well drained soils on flood plains. Seasonally wet and subject to occasional overflow. Runoff is slow, permeability is moderate, and the available water capacity is very high. Au, CN, CR, Fa. (For Arkabutla and Falaya soils in CN and CR, refer to group 1w9. For Bruno soil in CN, refer to group 2s5.)	Green ash White ash Eastern cottonwood Cherrybark oak Nuttall oak Water oak Willow oak Loblolly pine Shortleaf pine Sweetgum	90 90 110 110 100 100 100 90 80 100	Green ash, white ash, eastern cottonwood, cherrybark oak, Nuttall oak, southern red oak, water oak, white oak, willow oak, loblolly pine, shortleaf pine, sweetgum, yellow-poplar.
Group 1w9: Nearly level, somewhat poorly drained soils on flood plains. Frequently flooded. Runoff is slow, permeability is moderate, and the available water capacity is very high. AR. (For Rosebloom soil in AR, refer to group 2w9.)	Green ash Cottonwood Nuttall oak Water oak Loblolly pine Sweetgum	90 110 100 100 90-100 100	Green ash, baldcypress, cottonwood, Nuttall oak, water oak, willow oak, overcup oak, loblolly pine, sweetgum.
Group 2o7: Moderately well drained and well drained soils. Slopes are 0 to 5 percent. Runoff is slow to medium, permeability is moderate to slow, and the available water capacity is moderate to high. GrA, GrB2, LeB2, LoB2, PoB2, PrB2.	Cherrybark oak Water oak Loblolly pine Shortleaf pine Sweetgum	90 90 90 80 90	Cherrybark oak, southern red oak, water oak, white oak, loblolly pine, shortleaf pine, sweetgum, American sycamore, black tupelo.
Group 2s5: Only Bruno sandy loam is in this group. It is excessively drained, is nearly level, occurs on flood plains, and is frequently flooded. Permeability is moderately rapid, and the available water capacity is low. (Bruno soil is mapped only in association with Arkabutla and Collins soils.)	Willow oak Sweetgum	90 90	Green ash, cottonwood, American elm, cherrybark oak, Shumard oak, southern red oak, swamp chestnut oak, water oak, white oak, willow oak, sweetgum, sycamore, water tupelo, black willow.
Group 2w8: Somewhat poorly drained soils. Slopes are 0 to 5 percent. Permeability is slow, and the available water capacity is moderate. CcA, CcB2.	Cherrybark oak Water oak Loblolly pine Shortleaf pine Sweetgum	90 90 90 80 90	Cherrybark oak, swamp chestnut oak, water oak, white oak, loblolly pine, shortleaf pine, sweetgum, American sycamore, yellow-poplar.

rated because their properties are too variable]

Preferred species--Continued	Major hazards and limitations		
For planting	Erosion hazard	Equipment limitations	Seedling mortality
Green ash, eastern cottonwood, cherrybark oak, Nuttall oak, sweetgum, American sycamore, yellow-poplar, loblolly pine.	Slight	Slight	Slight.
Green ash, eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, loblolly pine, sweetgum, American sycamore, yellow-poplar.	Slight	Moderate	Slight to moderate.
Green ash, cottonwood, Nuttall oak, sweetgum, sycamore.	Slight	Severe	Moderate to severe.
Cherrybark oak, loblolly pine, sweetgum, yellow-poplar.	Slight	Slight	Slight.
Cherrybark oak, Shumard oak, water oak, sweetgum.	Slight	Moderate	Moderate.
Cherrybark oak, Shumard oak, water oak, loblolly pine, shortleaf pine, sweetgum.	Slight	Moderate	Slight to moderate.

TABLE 3.--WOODLAND

Woodland groups and mapping unit symbols	Potential productivity		Preferred species--
	Tree species	Average site index	In existing stands
Group 2w9: Only Rosebloom silt loam is in this group. It is poorly drained, occurs on flood plains, and is frequently flooded. Permeability is slow, and the available water capacity is very high. (Rosebloom soil is mapped only with Arkabutla soil.)	Green ash Eastern cottonwood Cherrybark oak Nuttall oak Water oak Willow oak Loblolly pine Shortleaf pine Sweetgum	90 100 90 100 90 80 90 80 90	Green ash, eastern cottonwood, cherrybark oak, Nuttall oak, overcup oak, Shumard oak, water oak, white oak, willow oak, loblolly pine, shortleaf pine, sweetgum, yellow-poplar.
Group 3o2: Severely eroded, moderately well drained to well drained soils. Slopes are 5 to 12 percent. Runoff is medium to rapid, permeability is moderate to slow, and the available water capacity is moderate to high. GrC3, LeC3, LeD3, LoC3, LoD3, MeC3, PoC3, PoD3, PrC3, PrD3.	Southern red oak Loblolly pine Shortleaf pine	74 85 65	Shumard oak, southern red oak, loblolly pine, shortleaf pine.
Group 3r2: Severely eroded, well drained and moderately well drained soils. Slopes are 12 to 30 percent. Runoff is rapid, permeability is moderate to moderately slow, and the available water capacity is moderate. CbE3.	Loblolly pine Shortleaf pine	80 70	Loblolly pine, shortleaf pine.
Group 3r7: Well drained and moderately well drained soils. Slopes are 12 to 30 percent. Runoff is rapid, permeability is moderate to moderately slow, and the available water capacity is moderate to high. CaE, CLF, PCF, PvE.	Cherrybark oak Southern red oak Water oak Loblolly pine Shortleaf pine Sweetgum	90 80 80 80 70 80	Cherrybark oak, southern red oak, swamp chestnut oak, water oak, white oak, loblolly pine, shortleaf pine, sweetgum, yellow-poplar.
Group 3w9: Only Henry silt loam is in this group. It is poorly drained. Slopes are 0 to 3 percent. Runoff is slow to very slow, permeability is slow, and the available water capacity is moderate. He.	Cherrybark oak Water oak Loblolly pine Shortleaf pine Sweetgum	80 80 80 70 80	Cherrybark oak, southern red oak, water oak, white oak, loblolly pine, shortleaf pine, sweetgum, tupelos, yellow-poplar.
Group 4c2: Well-drained and somewhat poorly drained soils that have a clayey subsoil. Slopes are 12 to 30 percent. Runoff is rapid, permeability is moderately slow to very slow, and the available water capacity is high. LSF, LuE3, LvE3.	Loblolly pine	70	Loblolly pine

SUITABILITY GROUPS--Continued

Preferred species--Continued	Major hazards and limitations		
For planting	Erosion hazard	Equipment limitations	Seedling mortality
Green ash, baldcypress, eastern cottonwood, cherrybark oak, Nuttall oak, swamp chestnut oak, water oak, willow oak, sweetgum, American sycamore, water tupelo, loblolly pine.	Slight----------	Severe----------	Moderate to severe.
Loblolly pine, shortleaf pine.	Moderate----------	Moderate----------	Moderate.
Loblolly pine, shortleaf pine.	Moderate----------	Moderate----------	Moderate.
Cherrybark oak, Shumard oak, water oak, white oak, loblolly pine, shortleaf pine, sweetgum.	Slight----------	Slight----------	Slight.
Cherrybark oak, Shumard oak, loblolly pine, sweetgum.	Slight----------	Severe----------	Moderate to severe.
Loblolly pine----------	Moderate----------	Moderate----------	Moderate.

The numeral 4 indicates soils that have no limitations or only slight limitations and are best suited to broadleaf trees. (None in this county.)

The numeral 5 indicates soils that have one or more moderate limitations and are best suited to broadleaf trees.

The numeral 6 indicates soils that have one or more severe limitations and are best suited to broadleaf trees. (None in this county.)

The numeral 7 indicates soils that have no limitations or only slight limitations and are suited to either needleleaf of broadleaf trees.

The numeral 8 indicates soils that have one or more moderate limitations and are suited to either needleleaf or broadleaf trees.

The numeral 9 indicates soils that have one or more severe limitations and are suited to either needleleaf or broadleaf trees.

The numeral 0 indicates soils that are not suitable for producing timber commercially. (None in this county.)

The main hazards or limitations that affect woodland management in Marshall County are erosion hazard, equipment limitations, and seedling mortality.

Erosion hazard refers to potential loss of soil following cutting operations and in areas where the soil is exposed along roads, trails, firebreaks, and in log yards. The potential erosion hazard is based on slope, soil depth, erodibility, and soil loss tolerance. The hazard is slight if expected soil loss is small; moderate if some soil loss is expected and care is needed during logging and other operations; severe if intensive treatment, special methods of operation, and special equipment are needed.

Equipment limitations are rated on the basis of soil characteristics that restrict or prohibit the use of equipment, such as trucks and tractors, commonly used in tending and harvesting the trees, in constructing roads, in logging, skidding, and hauling, and in controlling weeds and fires. In Marshall County soil characteristics having the most limiting effect are seasonal wetness, poor drainage, seasonal high water table, strong slopes, and poor texture of the surface layer. Slight means there is little or no restriction in the kind of equipment or in the time of year it is used; moderate means that use of equipment is restricted seasonally because of wetness, flooding, poor drainage, or other hazards; severe means that special equipment is needed.

Seedling mortality refers to the expected degree of mortality of planted or natural seedlings, excluding losses caused by plant competition, during the first two seasons of growth. Considered in the ratings are depth to the water table, hazard of flooding, drainage, soil depth and structure, droughtiness, and degree of erosion. Normal rainfall, good planting stock, and proper planting are assumed. A rating of slight indicates an expected loss of less than 25 percent of the planted seedlings; moderate, a loss of 25 to 50 percent of the seedlings; and severe, a loss of more than 50 percent of the seedlings. Special preparation of the site is needed before planting on soils rated severe and on most of the soils rated moderate.

WILDLIFE[3/]

Originally most of Marshall County was wooded and forest game was abundant. As land was cleared for crops, the number of deer, squirrels, and turkeys decreased considerably and the number of farm game increased. The type of farming practiced and the pattern of vegetation in cultivated areas provided habitat for great numbers of bobwhite, doves, rabbits, and many kinds of nongame birds and mammals.

Recent trends in land use are restoring the balance between forest game and farm game. Many eroded areas have been reforested as part of soil conservation projects, and about 47 percent of the county now is woodland.

All parts of the county provide habitat suitable for wildlife. Farm game, mainly bobwhite, doves, and rabbits, live in open areas where part of the acreage is cultivated. Plant cover particularly suited to bobwhite grows in areas that have been eroded and are no longer cultivated. Forest game, mainly deer, squirrels, and turkeys, live in wooded areas where the stands are partly hardwoods. Waterfowl live near water and marshes.

The three wildlife areas of the county are described in the following paragraphs. Each area consists of one or more of the soil associations described in the section "General Soil Map" and shown on the map at the back of this survey.

Wildlife Area 1

This area consists of soil associations 1 and 2. It makes up about 16 percent of the county. The soils are nearly level and well drained to poorly drained. They occur on flood plains. The well-drained soils are used for row crops, pasture, and hay. Good stands of bottom land hardwoods grow throughout this area

Wooded areas provide excellent habitat for deer, squirrels, turkeys, swamp rabbits, fur-bearing animals, and songbirds. The soils are well suited to a wide variety of bottom land hardwoods, vines, shrubs, and weeds. The age of stands and extent of cuttings determine the number of wildlife that can live in these areas.

Cultivated areas provide habitat for cottontail rabbits, bobwhite, doves, and many songbirds. The number of game depends largely on the amount of food and cover that grows around cultivated fields. Native and planted legumes and other plants provide food and cover for bobwhite and rabbits. Doves feed on native grasses and waste grain in cultivated fields; browntop millet can be planted as choice food for doves.

Pasture vegetation generally does not provide adequate food and cover except for rabbits. Where sufficient cover is nearby, both farm game and forest game can forage the edges of pasture.

Areas along the major streams provide habitat suitable for waterfowl. They feed mainly on native plants and millet. Shallow impoundments can be made in most areas to provide habitat for ducks.

Wildlife Area 2

This area consists of soil association 3. It makes up 2 percent of the county. The soils are moderately steep and occur on narrow ridgetops and side slopes on uplands. Most of the acreage is in hardwood forest.

Wooded areas provide habitat for forest game but do not support as large a wildlife population as wooded areas on flood plains. The soils are well suited to a wide variety of food and cover plants for forest game.

Areas of open land are few, and farm game is limited. In most areas, artificial ponds and lakes can be constructed and stocked with fish, but the soils are too steep for waterfowl habitat.

Wildlife Area 3

This area consists of soil associations 4, 5, and 6. It makes up 82 percent of the county. The soils are well drained to moderately well drained and nearly level to gently sloping. They occur on ridgetops and side slopes. Areas of Gullied land are common.

Wooded areas provide excellent food and cover for deer and squirrels.

Much of the acreage is in farms. Game is limited where the soils are intensively cultivated. Where established, food and cover plants for farm game grow well. Choice food plants for bobwhite are annual lespedeza, partridge peas, beggarticks, and other native plants. Quail favor millet, cowpeas, and lespedeza. Choice food plants for doves are corn, grain sorghum, browntop millet, and native grasses. Rabbits find cover in blackberry briers, brush, and annual weeds and feed on native and planted grasses and forbs.

Small lakes, ponds, and streams in this area provide habitat suitable for waterfowl and beavers. Japanese millet can be planted as choice food for waterfowl.

Sites suitable for farm ponds are common. Fish production is high in well-managed ponds. Because most of the soils are acid, the bottom of ponds should be limed before filling.

3/ By EDWARD G. SULLIVAN, biologist, Soil Conservation Service.

ENGINEERING USES OF THE SOILS[4/]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, water storage facilities, erosion control structures, and drainage systems. Among the soil properties most important in engineering are permeability, shear strength, density, shrink-swell potential, water-holding capacity, grain-size distribution, plasticity, and reaction.

Information concerning these and related properties is given in tables 4, 5, and 6. The estimates and interpretations of soil properties in these tables can be used to--

1. Make studies that will aid in selecting and developing sites for industrial, commercial, residential, and recreational uses.
2. Make preliminary evaluations that will aid in selecting locations for highways and airports and in planning detailed surveys of the soils at the site.
3. Develop information for the design of drainage systems, farm ponds, diversion terraces, and other structures for soil and water conservation.
4. Locate possible sources of sand and gravel.
5. Correlate performance of engineering structures with soil mapping units to develop information that can be useful in designing and maintaining such structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from published maps, reports, and aerial photographs for the purpose of making maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to a particular area.

With the soil map for identification of soil areas, the engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that these interpretations do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and excavations deeper than the depth of layers here reported.

Some terms used by soil scientists have a special meaning in soil science that may not be familiar to engineers. These terms are defined in the Glossary.

Engineering Classification Systems

Two systems of soil classification are in general use by engineers. They are the system adopted by the American Association of State Highway Officials (AASHO) (1), and the Unified system (14) used by the U.S. Department of Defense.

The AASHO system is used to classify soils according to those properties that affect use in highway construction. In this system, all soil material is classified in seven principal groups. The groups range from A-1, which consists of soils that have the highest bearing strength and are the best soils for subgrade, to A-7, which consists of soils that have the lowest strength when wet and are the poorest soils for subgrade. Within each group the relative engineering value of a soil material is indicated by a group index number given in parentheses. The numbers range from 0, for the best material, to 20, for the poorest. The group index number is shown in parentheses following the soil group symbol (see table 4). The AASHO classification for tested soils is shown in table 4. The estimated classification for all soils mapped in the survey area is given in table 5.

In the Unified system, soils are classified as coarse grained, fine grained, or organic, according to particle-size distribution, plasticity, liquid limit, and organic-matter content.

There are eight classes of coarse-grained soils. Each class consists of soils in which more than half the particles are larger than 0.074 millimeter. Symbols for these classes are G for gravel and S for sand combined with W for well graded, P for poorly graded, M for silty, or C for clayey.

There are six classes of fine-grained soils. More than half the particles in these soils are smaller than 0.074 millimeter. These classes are designated M for silts, C for clays, and O for organic soils combined with L for low liquid limit or H for high liquid limit.

Highly organic, or peaty, soils are designated by the symbol Pt.

A significant difference between the Unified system and the system used by the U.S. Department of Agriculture (USDA) is the definition of silt and clay. The Unified system divides fine-grained soils into silt or clay depending upon their physical behavior at various moisture content. In the USDA system, silt and clay soils are determined by particle size.

Engineering Test Data

Soil samples taken from three profiles in Marshall County were tested in accordance with standard procedures to help evaluate the soils for engineering purposes. Table 4 shows the results of tests to determine particle-size distribution and other properties significant in soil engineering. Some terms used in table 4 are explained in the following paragraphs.

In a moisture density or compaction test, a sample of soil material is compacted several times at the same compactive force, each time at a higher

4/ By EMMETT M. BOLAND, engineer, Soil Conservation Service.

moisture content. The dry density (unit weight) of the soil material increases until "optimum moisture content" is reached. After that, the dry density decreases with an increase of moisture content. The highest dry density obtained is the "maximum dry density." Moisture density data are important in earthwork because, as a rule, optimum stability is obtained if the soil is compacted to about maximum stability when it is at approximately optimum moisture content.

Mechanical analysis shows the percentage, by weight, of soil particles that pass sieves of specified sizes. Sand and other coarser materials do not pass the No. 200 sieve, but silt and clay do. In the AASHO system, silt is identified as material finer than 0.074 millimeter yet coarser than 0.005 millimeter. Clay is material finer than 0.005 millimeter. The particle-size distribution of materials passing the No. 200 sieve was determined by the hydrometer method.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. The plastic limit is the moisture content at which the soil passes from semisolid to plastic. If the moisture content is further increased, the material changes from a plastic to a liquid state. The liquid limit is the moisture content at which the material changes from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Estimated Soil Properties

Table 5 provides estimates of soil properties important in engineering. The estimates are based on field classification and descriptions, on physical and chemical tests of selected representative samples, on test data from comparable soils in adjacent areas, and on experience in working with the soils in Marshall County.

Each kind of soil that is given a separate rating is listed in alphabetical order. The mapping units are shown by placing the map symbols after the name of the soil series. Where important differences in engineering properties occur between mapping units of a series, these phases are rated separately. Ratings apply only to the depths indicated. Bedrock is well below these depths. Terms used in the table are explained in the following paragraphs.

The highest level to which the seasonal water table rises is given in table 5.

USDA texture is determined by the relative proportions of sand, silt, and clay material less than 2.0 millimeters in diameter. Sand, silt, clay, and other terms used in the USDA textural classification are defined in the Glossary.

Permeability indicates the rate at which water moves downward through undisturbed soil material. The rate depends largely on texture, porosity, and structure of the soil. A rate of less than 0.2 inches per hour is slow; 0.2 to 0.63, moderately slow; 0.63 to 2 inches, moderate; 2 to 6.3 inches, rapid; and more than 6.3 inches, very rapid.

Available water capacity refers to the capacity of a soil to hold water available for use by most plants. It is commonly defined as the difference between the amount of water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. Available water capacity is affected by the texture, structure, and organic-matter content of the soil.

Reaction refers to the degree of acidity or alkalinity of a soil, expressed as a pH value. A pH value of 7.0 is neutral. Lower values indicate acidity and higher values indicate alkalinity.

Shrink-swell potential indicates the volume change to be expected in soil material with changes in moisture content. Shrinking and swelling of soils cause much damage to roads, building foundations, and other structures. A high shrink-swell potential indicates hazards to the maintenance of structures constructed in, on, or with such materials.

Engineering Interpretations

Table 6 contains information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, and buildings. Detrimental or undesirable features are emphasized, but very important desirable features also are listed. The ratings and other interpretations in this table are based on the estimated engineering properties of the soils shown in table 5; on available test data, including those in table 4; and on field experience. The information applies to soil depths of 6 feet or less. The terms used in the table are explained in the following paragraphs.

Topsoil refers to soil material used to topdress lawns, roadbanks, and the like. The ratings indicate suitability for such use and are based mainly on fertility and organic-matter content.

Ratings for sand are based on the probability that areas of the soil contain deposits of sand coarser than 0.08 millimeters in diameter. Sand commonly is used for filter drains, as aggregate for concrete, and as granular subbase for roads. The ratings do not indicate the quality or extent of deposits.

Road fill is material used to build embankments that support the subbase, base, or surface course of roads. The ratings are based on the performance of soil material removed from borrow areas and used for highway subgrade. In general, a sandy material that contains adequate binder is best. Organic materials and plastic clays that have high shrink-swell potential are the poorest. Bruno and Cahaba soils generally are the best sources of road fill in the county.

Highway location is affected mainly by ponding, flooding, seasonal high water table, and other

TABLE 4.--ENGINEERING

[Tests performed by Mississippi State Highway Department and Federal Highway Administration (FHWA) in

Soil name and location	Report number	Depth	Moisture density 1/		Volume change	Shrinkage limit	Plastic limit	Shrinkage ratio
			Maximum dry density	Optimum moisture				
		Inches	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Henry silt loam:								
NE¼SW¼NE¼ sec. 17,	517106	7-22	108	15	12	17	23	1.67
T. 3 S., R. 2 W.	517107	22-27	106.2	17	27	16	25	1.70
(Modal)	517108	27-44	105	18	29	18	21	1.69
Lexington silt loam:								
SE¼SW¼SE¼ sec. 25,	517109	14-26	105	18	42	17	26	1.71
T. 4 S., R. 3 W.	517110	26-37	110	15	34	17	22	1.71
(Modal)	517111	48-62	124	10	29	9	15	1.97
Providence silt loam:								
SE¼NE¼ sec. 20,	517114	3-14	108	17	48	13	23	1.84
T. 3 S., R. 2 W.	517115	26-40	119	12	27	10	16	1.89
(Modal)	517116	50-60	126	9	26	8	14	1.98

1/ Based on AASHO Designation T 99.

2/ Mechanical analyses according to the AASHO Designation T 88. Results by this procedure may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service. In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

accordance with standard procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis 2/							Liquid limit	Plasticity index	Classification	
Percentage passing sieve--			Percentage smaller than--							
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified 3/
							Pct.			
100	99	97	86	57	19	12	25	2	A-4(8)	ML
100	99	97	88	61	28	22	34	9	A-4(8)	ML-CL
100	97	94	85	58	25	17	35	14	A-6(10)	CL
100	97	92	81	55	22	17	42	16	A-7-6(11)	ML-CL
100	92	80	74	49	24	20	37	15	A-6(10)	CL
100	73	42	35	25	13	11	24	9	A-4(1)	SC
100	95	87	78	57	28	21	40	17	A-6(11)	CL
100	84	62	54	35	14	11	25	9	A-4(5)	CL
100	68	33	26	20	11	10	22	8	A-2-4(0)	SC

3/ SCS and FHWA have agreed to give all soils having a plasticity index within two points of A-line a borderline classification. An example is ML-CL.

[An asterisk in the first column indicates that at least one mapping unit in this series is made of two or more reason it is necessary to follow carefully the instructions for referring

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification		
			USDA texture	Unified	AASHO
	Inches	Inches			
*Arkabutla: AR, Au---------- For Rosebloom part of AR, refer to Rosebloom series.	12	0-19 19-50	Silt loam---------- Silty clay loam------	CL CL	A-6 or A-4 A-6
Bruno---------- Mapped only with Collins and Arkabutla soils.	>40	0-8 8-13 13-54	Sandy loam---------- Silt loam---------- Loamy sand----------	SM ML SM	A-2, A-4 A-4 A-2
*Cahaba: CaE, CbE3, CLF--------- For Lexington part of CaE and CLF, refer to Lexington series. For Providence part of CbE3, refer to Providence series.	>20	0-7 7-34 34-56	Loam---------- Sandy clay loam------ Sandy loam----------	ML SC SM	A-4 A-4, A-6 A-2, A-4
Calloway: CcA, CcB2----------	12	0-5 5-22 22-54	Silt loam---------- Silt loam---------- Silty clay loam------	ML ML, CL CL	A-4 A-6 A-6, A-7
Cascilla: Cm----------	>48	0-7 7-60	Silt loam---------- Silt loam----------	ML ML, CL	A-4 A-4
*Collins: CN, Co, CR---------- For Arkabutla part of CN and CR, refer to Arkabutla series. For Bruno part of CN, refer to Bruno series. For Falaya part of CR, refer to Falaya series.	20	0-60	Silt loam----------	ML or ML-CL	A-4
Falaya: Fa----------	12	0-60	Silt loam----------	ML	A-4
Grenada: GrA, GrB2, GrC3--------	20	0-5 5-33 33-59 59-80	Silt loam---------- Silt loam---------- Silt loam---------- Silt loam----------	ML CL CL ML	A-4 A-6 or A-7 A-6 A-4
*Gullied land: GuE, GvE. No reliable estimates can be made. For Cahaba part of GuE refer to Cahaba series. For Loring part of GvE, refer to Loring series.					

kinds of soil. The soils in such mapping units may have different properties and limitations, and for this to other series that appear in the first column of this table]

Percentage passing sieve--				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Inches/hour	Inches/inch of soil	pH	
100	100	90-100	85-95	0.63-2.0	0.15-0.20	4.5-5.5	Low.
100	100	95-100	85-95	0.63-2.0	0.20-0.22	4.5-5.5	Moderate.
100	100	60-70	30-40	2.00-6.3	0.10-0.15	5.1-7.8	Low.
100	100	90-100	70-90	2.00-6.3	0.15-0.20	5.1-7.8	Low.
100	100	50-75	15-30	6.3-20.0	0.05-0.10	5.1-7.8	Low.
100	100	85-95	60-75	2.0-6.3	0.10-0.15	4.5-5.5	Low.
100	100	85-95	40-50	0.63-2.0	0.10-0.15	4.5-5.5	Low to moderate.
100	100	60-70	30-40	2.0-6.3	0.10-0.15	4.5-5.5	Low.
100	100	95-100	90-100	0.63-2.0	0.10-0.15	5.1-6.0	Low.
100	100	95-100	90-95	0.63-2.0	0.10-0.15	5.1-6.0	Low.
100	100	95-100	85-95	0.06-0.20	0.10-0.15	5.1-6.0	Moderate.
100	100	95-100	90-100	0.63-2.0	0.18-0.22	4.5-5.5	Low.
100	100	95-100	90-100	0.63-2.0	0.18-0.22	4.5-5.5	Low.
100	100	95-100	90-100	0.63-2.0	0.20-0.23	4.5-5.5	Low.
100	100	100	95-100	0.63-2.0	0.20-0.22	4.5-5.5	Low.
100	100	100	90-100	0.63-2.0	0.15-0.20	5.1-6.0	Low.
100	100	100	90-100	0.63-2.0	0.10-0.15	5.1-6.0	Moderate.
100	100	95-100	90-100	0.06-0.20	0.10-0.15	5.1-6.0	Low to moderate.
100	100	95-100	80-90	0.06-0.20	0.15-0.20	5.1-6.0	Low.

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TABLE 5.--ESTIMATED PROPERTIES

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification		
			USDA texture	Unified	AASHO
	Inches	Inches			
Henry: He	0	0-22	Silt loam	ML	A-4
		22-44	Silt loam or silty clay loam.	CL or ML-CL	A-6
		44-80	Silt loam	ML-CL or CL	A-4 or A-6
Lexington: LeB2, LeC3, LeD3	>60	0-5	Silt loam	ML	A-4
		5-26	Silty clay loam	ML or CL	A-7
		26-48	Silt loam	CL	A-6
		48-65	Sandy loam	SM or SC	A-2 or A-4
Loring: LoB2, LoC3, LoD3	26	0-5	Silt loam	ML	A-4
		5-26	Silty clay loam	ML, CL	A-6
		26-80	Silt loam	ML	A-4
*Luverne: LSF, LuE3, LvE3	>60	0-4	Sandy clay loam	CL	A-6
For Susquehanna part of LSF and LvE3, refer to Susquehanna series.		4-29	Silty clay	CL	A-7
		29-48	Silty clay loam or loam.	ML, CL	A-7
		48-54	Silty clay	CL	A-7
Memphis: MeA, MeB2, MeC3	>60	0-5	Silt loam	ML	A-4
		5-30	Silty clay loam	CL	A-6
		30-72	Silt loam	ML	A-4
Ochlockonee: Oc	>30	0-21	Sandy loam	SM	A-2 or A-4
		21-30	Fine sandy loam	SM	A-2 or A-4
		30-52	Sandy loam	SM	A-2 or A-4
*Providence:					
PCF, PoB2, PoC3, PoD3, PvE	26	0-3	Silt loam	ML	A-4
For Cahaba part of PCF and PvE, refer to Cahaba series.		3-26	Silty clay loam	CL	A-6
		26-50	Silt loam	CL	A-4
		50-60	Loam	ML, SC	A-4 or A-2
PrB2, PrC3, PrD3	26	0-3	Silt loam	ML	A-4
		3-23	Silt loam	CL	A-6
		23-41	Silty clay loam	CL	A-6
		41-54	Silty clay	CL or CH	A-6 or A-7
Rosebloom	0	0-4	Silt loam	ML	A-6 or A-4
Mapped only with Arkabutla soils.		4-48	Silty clay loam	CL	A-6
Susquehanna	12	0-6	Silty clay loam	CL	A-7
Mapped only with Luverne soils.		6-17	Silty clay	CH	A-7
		17-58	Clay	CH	A-7
Swamp: Sw. No reliable estimates can be made.					
*Vicksburg: Va, Vo	>30	0-61	Silt loam	ML	A-4
For Ochlockonee part of Vo, refer to Ochlockonee series.					

OF THE SOILS--Continued

Percentage passing sieve--				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
				Inches/hour	Inches/inch of soil	pH	
100	100	95-100	95-100	0.63-2.0	0.15-0.20	4.5-6.0	Low.
100	100	95-100	90-100	0.06-0.20	0.10-0.15	4.5-6.0	Low to moderate.
100	100	95-100	90-100	0.06-0.20	0.10-0.15	4.5-6.0	Low.
100	100	95-100	90-100	0.63-2.0	0.15-0.20	4.5-6.0	Low.
100	100	95-100	85-95	0.63-2.0	0.20-0.22	4.5-6.0	Moderate.
100	100	90-100	70-90	0.63-2.0	0.15-0.20	4.5-6.0	Low.
100	100	60-70	30-45	2.0-6.3	0.10-0.15	4.5-6.0	Low.
100	100	100	90-100	0.63-2.0	0.20-0.22	5.1-6.0	Low.
100	100	100	90-100	0.63-2.0	0.20-0.22	5.1-6.0	Moderate.
100	100	100	90-100	0.20-0.63	0.10-0.15	5.1-6.0	Low.
100	100	80-90	60-75	0.63-2.0	0.15-0.20	4.5-5.5	Low.
100	100	95-100	90-95	0.20-0.63	0.15-0.20	4.5-5.5	Moderate.
100	100	90-100	85-95	0.20-0.63	0.15-0.20	4.5-5.5	Moderate.
100	100	95-100	90-95	0.20-0.63	0.15-0.20	4.5-5.5	Moderate.
100	100	100	90-100	0.63-2.0	0.20-0.22	5.1-6.0	Low.
100	100	100	90-100	0.63-2.0	0.20-0.22	5.1-6.0	Moderate.
100	100	100	90-100	0.63-2.0	0.20-0.22	5.1-6.0	Low.
100	100	90-100	30-50	0.63-2.0	0.10-0.15	4.5-5.5	Low.
100	100	85-100	30-50	0.63-2.0	0.10-0.15	4.5-5.5	Low.
100	100	90-100	30-50	0.63-2.0	0.10-0.20	4.5-5.5	Low.
100	100	90-100	85-100	0.63-2.0	0.20-0.22	4.5-5.5	Low.
100	100	95-100	85-100	0.63-2.0	0.20-0.22	4.5-5.5	Moderate.
100	100	80-95	60-85	0.20-0.63	0.10-0.15	4.5-5.5	Low.
100	100	65-85	30-75	0.20-0.63	0.10-0.15	4.5-5.5	Low.
100	100	95-100	85-100	0.63-2.0	0.15-0.20	4.5-5.5	Low.
100	100	95-100	85-100	0.63-2.0	0.20-0.22	4.5-5.5	Moderate.
100	100	90-100	85-100	0.20-0.63	0.10-0.15	4.5-5.5	Moderate.
100	100	95-100	90-95	0.20-0.63	0.10-0.15	4.5-5.5	High.
100	100	85-100	85-95	0.63-2.0	0.15-0.20	4.5-5.5	Low.
100	100	85-100	85-95	0.06-0.20	0.20-0.22	4.5-5.5	Moderate.
100	100	95-100	85-95	0.20-0.63	0.20-0.22	4.5-5.5	Moderate.
100	100	95-100	90-95	0.06-0.20	0.15-0.20	4.5-5.5	High.
100	100	90-100	75-95	0.00-0.06	0.15-0.20	4.5-5.5	Very high.
100	100	95-100	85-100	0.63-2.0	0.20-0.22	4.5-5.5	Low.

TABLE 6.--ENGINEERING

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or reason it is necessary to follow carefully the instructions for referring

Soil series and map symbols	Suitability as source of--			Soil features affecting--	
	Topsoil	Sand	Road fill	Highway location	Dikes or levees
*Arkabutla: AR, Au---- For Rosebloom part of AR, refer to Rosebloom series.	Fair----------	Not suited-------	Fair: fair traffic-supporting capacity.	High water table; subject to overflow.	Fair stability.
Bruno---------- Mapped only with Arkabutla and Collins soils.	Poor----------	Fair to good-----	Good----------	Subject to flooding.	Moderately rapid permeability.
*Cahaba: CaE, CLF, CbE3. For Lexington part of CaE and CLF, refer to Lexington series. For Providence part of CbE3, refer to Providence series.	Fair----------	Poor: fair in places.	Good----------	Features generally favorable; hilly.	Fair to good strength and stability.
Calloway: CcA, CcB2--	Fair----------	Not suited------	Fair: fair traffic-supporting capacity.	Perched water table; fragipan impedes internal drainage.	Unstable; can be used if moisture content is controlled.
Cascilla: Cm---------	Good----------	Not suited------	Fair: moderately erodible.	Subject to flooding; moderate traffic-supporting capacity.	Fair stability and strength.
*Collins: CN, Co, CR. For Arkabutla part of CN and CR, refer to Arkabutla series. For Bruno part of CN, refer to Bruno series. For Falaya part of CR, refer to Falaya series.	Good----------	Not suited------	Fair: fair traffic-supporting capacity.	Subject to flooding.	Fair stability and strength.

more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this to other series that appear in the first column of this table]

Soil features affecting--Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankments				
Moderate permeability and seepage rate.	Fair strength and stability.	High water table; subject to flooding; needs surface drainage.	Moderate permeability.	Not needed; subject to flooding.	Very high available water capacity; sod grows well.
Moderately rapid permeability.	Moderately rapid permeability.	Excessively drained.	Moderately rapid permeability.	Generally not needed; subject to flooding.	Moderately rapid permeability.
Moderate permeability.	Moderately resistant to piping and erosion.	Well drained; slopes.	Moderate permeability.	Features generally favorable.	Moderate permeability.
Slow permeability in fragipan.	Low to fair strength and stability.	High water table; needs surface drainage.	Moderate permeability above fragipan; slow permeability in fragipan.	Features generally favorable.	Difficult to establish sod.
Moderate permeability.	Fair stability and strength.	Subject to flooding; surface drainage needed in low-lying areas.	Moderate permeability.	Not needed; subject to flooding.	Easy to establish sod.
Moderate permeability.	Fair stability and strength.	Subject to flooding; needs surface drainage.	Moderate permeability.	Generally not needed; subject to flooding.	Easy to establish sod.

TABLE 6.--ENGINEERING INTERPRETATIONS

Soil series and map symbols	Suitability as source of--			Soil features affecting--	
	Topsoil	Sand	Road fill	Highway location	Dikes or levees
Falaya: Fa----------	Good----------	Not suited-------	Fair: fair traffic-supporting capacity.	High water table; subject to flooding.	Slopes; fair stability.
Grenada: GrA, GrB2, GrC3.	Fair----------	Not suited-------	Fair: fair traffic-supporting capacity.	Fragipan impedes internal drainage.	Slopes; low to fair stability.
*Gullied land: GuE, GvE. Properties of Gullied land are too variable to rate. For Cahaba part of GuE, refer to Cahaba series. For Loring part of GvE, refer to Loring series.					
Henry: He----------	Poor----------	Not suited-------	Poor: wetness---	High water table; low to flat depressional areas.	Fair slope stability.
Lexington: LeB2, LeC3, LeD3.	Fair----------	Underlying material good for subgrade in some areas.	Fair to good traffic-supporting capacity.	Sloping topography; silty material over sandy material.	Fair to good strength and stability.
Loring: LoB2, LoC3, LoD3.	Fair----------	Not suited-------	Fair to good traffic-supporting capacity.	Fragipan impedes internal drainage.	Fair slope stability.
*Luverne: LSF, LuE3, LvE3. For Susquehanna part of LSF and LvE3, refer to Susquehanna series.	Poor----------	Not suited-------	Fair: moderate shrink-swell potential.	Hilly; moderate shrink-swell potential.	Moderate shrink-swell potential.
Memphis: MeA, MeB2, MeC3.	Fair----------	Not suited-------	Fair: fair traffic-supporting capacity.	Moderate traffic-supporting capacity; easily eroded.	Moderate stability and strength.

OF THE SOILS--Continued

Soil features affecting--Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankments				
Moderate permeability.	Fair stability-	High water table; subject to flooding; needs surface drainage.	Moderate permeability.	Not needed; floods.	Easy to establish sod.
Slow permeability in fragipan.	Fair stability.	High water table; needs surface drainage on slopes of 0 to 2 percent.	Moderate permeability above fragipan; slow in fragipan.	Features generally favorable.	Sod grows well except where fragipan is exposed.
Slow permeability.	Fair slope stability.	High water table; needs surface drainage.	Slow permeability.	Not needed; nearly level.	Sod grows well to fairly well except where fragipan is exposed.
Moderate permeability.	Fair to good strength and stability.	Not generally needed; slopes; well drained.	Moderate permeability.	Features generally favorable.	Highly erodible.
Moderate permeability in fragipan.	Fair slope stability.	Moderately well drained; drainage generally not needed.	Moderate permeability above fragipan; moderately slow in fragipan.	Features generally favorable.	Sod grows well except where fragipan is exposed.
Moderately slow permeability.	Fair strength and stability; may crack when dry.	Well drained-------	Hilly topography; moderately slow permeability.	Short steep slopes; features generally favorable.	Highly erodible; sod grows well to fairly well.
Moderate strength and stability.	Moderate strength and stability.	Well drained; needs surface drainage on 0 to 2 percent slopes.	Moderate permeability.	Features generally favorable.	Sod grows well.

TABLE 6.--ENGINEERING INTERPRETATIONS

Soil series and map symbols	Suitability as source of--			Soil features affecting--	
	Topsoil	Sand	Road fill	Highway location	Dikes or levees
Ochlockonee: Oc------	Fair to good--	Poor----------	Fair to good----	Subject to flooding.	Fair strength and stability; moderate permeability.
*Providence: PCF, PoB2, PoC3, PoD3, PvE. For Cahaba part of PCF and PvE, refer to Cahaba series.	Fair----------	Fair: underlying material in places is suitable for road subgrade.	Fair: fair traffic-supporting capacity.	Fragipan impedes internal drainage; moderate traffic-supporting capacity.	Fair stability; moderate compressibility.
PrB2, PrC3, PrD3---	Fair in upper part; poor below fragipan.	Not suited-------	Poor: underlain by plastic silty clay.	Topography; underlain by silty clay with high shrink-swell potential.	Fair to low strength and stability.
Rosebloom---------- Mapped only with Arkabutla soils.	Fair----------	Not suited------	Poor: wetness--	Subject to flooding.	Fair to low strength and stability.
Susquehanna---------- Mapped only with Luverne soils.	Poor----------	Not suited-------	Poor: very high shrink-swell potential.	Very high shrink-swell potential.	Very high shrink-swell potential.
Swamp: Sw. Properties too variable to rate.					
*Vicksburg: Va, Vo---- For Ochlockonee part of Vo, refer to Ochlockonee series.	Good----------	Not suited-------	Fair: fair traffic-supporting capacity.	Subject to flooding.	Low to fair stability; erodes easily.

Soil features affecting--Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankments				
Subject to flooding; moderate permeability.	Some seepage likely; fair to good strength and stability.	Well drained but needs surface drainage.	Moderate permeability.	Not needed; subject to flooding.	Sod grows well.
Moderately slow permeability in fragipan; excessive seepage below fragipan.	Fair strength and stability; moderate compressibility.	Moderately well drained; drainage generally not needed; slopes.	Moderate permeability above fragipan; moderately slow in fragipan.	Features generally favorable.	Sod grows well except where fragipan is exposed.
Slow seepage rate.	Low to fair strength and stability.	Moderately well drained; slopes.	Moderate permeability above fragipan; moderately slow in fragipan.	Features generally favorable.	Difficult to establish sod.
Slow seepage rate.	Low to fair strength and stability.	Poorly drained; needs surface drainage, floods.	Slow permeability.	Not needed; floods.	Sod grows well.
Very slow permeability.	Very high shrink-swell potential.	Somewhat poorly drained, but drainage not generally needed; slopes.	Very slow permeability.	Difficult to establish sod in places.	Difficult to establish sod in places.
Moderate permeability.	Low stability; erodes easily.	Subject to flooding; needs surface drainage.	Moderate permeability.	Not needed; subject to flooding.	Sod grows well.

hazards that affect the construction and maintenace of highways. The entire profile of undisturbed soil is considered. On soils that are ponded, roads must be constructed on high embankment sections or must be provided with surface and subsurface drains. On soils that are flooded, such as those of the Arkabutla, Collins, Falaya, and Vicksburg series, roads must be constructed on continuous embankments several feet above the usual level of floodwater.

Dikes and levees are low structures designed to impound or divert water. The soil features given are those of disturbed soil materials used to construct low dikes and levees.

Farm ponds supply water for livestock and offer opportunities for recreation (pl. II, bottom). They are affected mainly by soil features that influence the rate of seepage. Soils that have moderate to slow permeability, and consequently have slow seepage, can be used for reservoir areas. Embankments are earthfilled dams constructed to impound water. Features that influence the strength and stability of disturbed and compacted soil materials are given.

Agricultural drainage is affected mainly by the presence of a water table, soil permeability, and depth to cemented layers, sand, or other material that impedes or accelerates the movement of water through the soil. Slopes also are an important factor. Most nearly level soils in the county require drainage for crops, but the gently sloping to strongly sloping soils generally do not.

Irrigation systems are affected by such features as slope, erodibility, permeability, and drainage.

Terraces and diversions are essential for effective erosion control and for protecting areas downslope from runoff. Shallowness of the soils and irregular and steep topography are among the features unfavorable for this use.

Waterways for agricultural drainage and erosion control generally are required for soils on flood plains and for nearly level soils on uplands. The erodibility of the soils affects shaping, seeding, and establishing waterways, and a seasonal high water table limits the use of equipment.

TOWN AND COUNTRY PLANNING[5/]

Proximity to Memphis, Tennessee, and easy access to all parts of the county from State and U.S. Highways have contributed to the steadily increasing demand for housing subdivisions, vacation cottages, and recreational facilities in Marshall County. This section provides information that can be used by planners, builders, developers, landscape architects, and others interested in these nonfarm uses of the soils.

The degree and kind of soil limitations for selected nonfarm uses are given in table 7. Among the important soil features considered are depth, acidity, slope, permeability, depth to a water table, traffic-supporting capacity, and flood hazards. The information given in the table does not eliminate the need for onsite investigation, but it can help guide the selection of sites for a given use. In the following paragraphs the terms used in the table are defined and the basis for the ratings is explained.

Sewage lagoon is an embanked pond used to hold sewage for the time required for bacterial decomposition. Properties that affect the pond floor and the stability of the embankment are considered. Among them are soil texture, erodibility, permeability, organic-matter content, slope, and flood hazard.

Septic tank filter field is a system of subsurface tile lines that distributes effluent from a septic tank into the natural soil. The soil material between depths of 18 and 72 inches is evaluated. Permeability, depth to a water table, flood hazard, slope, and other properties that affect the absorption of effluent and the construction and operation of the tile system are considered.

Foundations for small buildings refer to vacation cottages, comfort stations, lodges, pavilions, bathhouses, restaurants, motels, and other buildings not more than three stories high. The type of sewage disposal system is not considered in the evaluation. Intensive site preparation generally is required.

Soils with slight limitations have slopes of less than 6 percent, have low shrink-swell potential, have high bearing capacity, are free of flooding, and have a water table below a depth of 60 inches all year. Soils with moderate limitations have features generally favorable for this use, except for one or more of the following: slopes of 6 to 12 percent, a seasonal high water table between depths of 24 and 60 inches, and moderate shrink-swell potential. Soils with severe limitations have slopes steeper than 12 percent, have high shrink-swell potential, are frequently flooded, or have a seasonal high water table within a depth of 24 inches.

Roads and streets refer mainly to improved streets, service roads, and parking areas. Normally they require only limited excavation and subgrade preparation. The soils must be capable of supporting heavy automobile traffic.

Soils with slight limitations have slopes of less than 5 percent, are free of flooding, have good traffic-supporting capacity, and have a water table below a depth of 30 inches all year. Soils with moderate limitations have features generally favorable for this use, except for one or more of

5/ By GEORGE W. YEATES, staff conservationist, Soil Conservation Service.

the following: moderate traffic-supporting capacity, slopes of 5 to 12 percent, and floods once in 5 to 20 years. Soils with severe limitations have slopes steeper than 12 percent, are frequently flooded, have poor traffic-supporting capacity, or have a water table within a depth of 30 inches for 8 months or less.

Paths and trails are used for hiking, horseback riding, and bicycling. Selection of sites for these activities is largely influenced by their condition as they occur in nature. However, site preparation that includes some clearing and minor cuts and fills commonly is needed.

Soils with slight limitations have slopes of less than 12 percent, have good traffic-supporting capacity, are free of flooding, and have slight erodibility. Soils with moderate limitations have features generally favorable for this use, except for one or more of the following: a water table within a depth of 20 inches for short periods, floods two or three times during the season of use, slopes of 12 to 25 percent, and fair traffic-supporting capacity. Soils with severe limitations have slopes steeper than 25 percent, have poor traffic-supporting capacity, or are frequently flooded.

Campsites are areas for temporary living out-of-doors in tents, pickup campers, or camping trailers. Site preparation normally includes clearing an area for tents and an area for parking cars and trailers. Soils for campsites should be well suited to heavy vehicle and pedestrian traffic during the period May through September.

Soils with slight limitations for this use have slopes of less than 8 percent, have good traffic-supporting capacity, are free of flooding, and have slight inherent erodibility. Soils with moderate limitations have features generally favorable for this use, except for one or more of the following: a water table within a depth of 20 inches during the season of use, moderately slow or slow permeability, and slopes of 8 to 12 percent. Soils with severe limitations have slopes steeper than 12 percent, have poor traffic-supporting capacity, are frequently flooded, or have very slow permeability.

Picnic areas, where a meal is eaten out-of-doors, can be expected to be used to some degree throughout the year. The soils should support heavy pedestrian traffic. Site preparation is required for the placement of picnic tables and grills.

Soils with slight limitations have slopes of less than 8 percent, have good traffic-supporting capacity, are free of flooding, and have slight erodibility. Soils with moderate limitations have features generally favorable for this use, except for one or more of the following: moderate traffic-supporting capacity, floods once or twice during the season of use, and slopes of 8 to 12 percent. Soils with severe limitations have slopes of more than 12 percent, have poor traffic-supporting capacity, are frequently flooded, or have poor drainage.

Intensive play areas are playgrounds for small children and areas used for baseball, softball, tennis, archery, target and skeet shooting, and other group or competitive sports. Site preparation that includes clearing, grading, shaping, and draining may be required where relatively large areas are used for these activities.

Soils with slight limitations have slopes of less than 2 percent, good traffic-supporting capacity, and good drainage. Soils with moderate limitations have features generally favorable for this use, except for one or more of the following: a water table within a depth of 20 inches during the season of use, floods once in 2 years during the season of use, moderately slow or slow permeability, and slopes of 2 to 5 percent. Soils with severe limitations have slopes of more than 5 percent, are subject to flooding, have very slow permeability, have poor traffic-supporting capacity, or are wet.

TABLE 7.--DEGREE AND KIND OF

[An asterisk in the first column indicates that at least one mapping unit in this series consists of two or more reason it is necessary to follow carefully the instructions for referring

Soil series and map symbols	Sewage lagoons	Septic tank filter fields	Foundations for small buildings
*Arkabutla: Au, AR---------- For Rosebloom part of AR refer to Rosebloom series.	Moderate: probable flood damage to embankment.	Severe: seasonal high water table; subject to flooding.	Severe: seasonal high water table; subject to flooding.
Bruno---------- Mapped only with Arkabutla and Collins soils.	Severe: moderately rapid permeability.	Severe: subject to flooding.	Severe: subject to flooding.
Cahaba:			
CaE, CLF---------- Ratings also apply to Lexington part.	Severe: slope----------	Severe: slope----------	Severe: slope----------
CbE3---------- Ratings also apply to Providence part.	Severe: slope----------	Severe: slope----------	Severe: slope----------
Calloway:			
CcA----------	Slight----------	Severe: seasonal high water table; slow permeability in fragipan.	Severe: seasonal high water table.
CcB2----------	Moderate: slope---------	Severe: seasonal high water table; slow permeability in fragipan.	Severe: seasonal high water table.
Cascilla: Cm----------	Moderate: probable flood damage to embankment.	Severe: subject to flooding.	Severe: subject to flooding.
*Collins: CN, Co, CR--------- For Arkabutla part of CN and CR, refer to Arkabutla series. For Bruno part of CN, refer to Bruno series. For Falaya part of CR, refer to Falaya series.	Moderate: moderate permeability.	Severe: subject to flooding.	Severe: subject to flooding.
Falaya: Fa----------	Moderate: moderate permeability.	Severe: seasonal high water table; subject to flooding.	Severe: subject to flooding.
Grenada:			
GrA----------	Slight----------	Severe: seasonal high water table; slow permeability in fragipan.	Moderate: moderate bearing capacity.
GrB2----------	Moderate: slope---------	Severe: seasonal high water table; slow permeability in fragipan.	Moderate: moderate bearing capacity.
GrC3----------	Moderate: slope---------	Severe: seasonal high water table; slow permeability in fragipan.	Moderate: moderate bearing capacity.

kinds of soil. The soils in such mapping units may have different properties and limitations, and for this to other series that appear in the first column of this table]

Roads and streets	Paths and trails	Campsites	Picnic areas	Intensive play areas
Severe: seasonal high water table; subject to flooding.	Moderate: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Moderate: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.
Severe: slope-------	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Moderate: slope-----	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Moderate: wetness--	Moderate: wetness--	Moderate: wetness--	Moderate: wetness; slow permeability in fragipan.
Moderate: moderate traffic-supporting capacity.	Moderate: wetness--	Moderate: wetness--	Moderate: wetness--	Moderate: wetness; slow permeability in fragipan.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.
Severe: subject to flooding.	Moderate to severe: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.
Severe: seasonal high water table; subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding; wetness.	Moderate: subject to flooding.	Severe: subject to flooding; wetness.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: slow permeability in fragipan.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: slow permeability in fragipan.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Severe: slope.

Soil series and map symbols	Sewage lagoons	Septic tank filter fields	Foundations for small buildings
* Gullied land: GuE, GvE. Gullied land too variable to be rated. For Cahaba part of GuE, refer to Cahaba series. For Loring part of GvE, refer to Loring series.			
Henry: He	Slight	Severe: high water table; slow permeability.	Severe: high water table.
Lexington:			
LeB2	Severe: moderately rapid permeability in lower part of subsoil.	Slight	Moderate: moderate bearing capacity.
LeC3	Severe: moderately rapid permeability in lower part of subsoil.	Moderate: slope	Moderate: slope
LeD3	Severe: moderately rapid permeability in lower part of subsoil.	Moderate to severe: slope.	Moderate: slope
Loring:			
LoB2	Moderate: slope	Severe: moderately slow permeability in fragipan.	Moderate: moderate bearing capacity.
LoC3	Moderate: slope	Severe: moderately slow permeability in fragipan.	Moderate: moderate bearing capacity.
LoD3	Severe: slope	Severe: moderately slow permeability in fragipan.	Moderate: moderate bearing capacity.
*Luverne: LSF, LuE3, LvE3--- For Susquehanna part of LSF and LvE3, refer to Susquehanna series.	Severe: slope	Severe: slope	Severe: slope
Memphis:			
MeA	Moderate: moderate permeability.	Slight	Moderate: moderate bearing capacity.
MeB2	Moderate: moderate permeability.	Slight	Moderate: moderate bearing capacity.
MeC3	Moderate: moderate permeability.	Moderate: slope	Moderate: moderate bearing capacity.
Ochlockonee: Oc	Moderate to severe: subject to flooding; seepy.	Severe: subject to flooding.	Severe: subject to flooding.

Roads and streets	Paths and trails	Campsites	Picnic areas	Intensive play areas
Severe: high water table.	Severe: wetness----	Severe: wetness----	Severe: wetness----	Severe: wetness.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Moderate: slope----	Moderate: slope----	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: moderately slow permeability.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Severe: slope; moderately slow permeability in fragipan.
Moderate: moderate traffic-supporting capacity.	Slight----------	Moderate: slope----	Moderate: slope----	Severe: slope.
Severe: slope------	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Slight.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Severe: slope.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.

Soil series and map symbols	Sewage lagoons	Septic tank filter fields	Foundations for small buildings
Providence:			
PCF---------- Ratings also apply to Cahaba part.	Severe: slope----------	Severe: slope----------	Severe: slope----------
PoB2----------	Moderate: slope---------	Severe: moderately slow permeability.	Moderate: moderate bearing capacity.
PoC3----------	Moderate: slope---------	Severe: moderately slow permeability in fragipan.	Moderate: moderate bearing capacity.
PoD3----------	Severe: slope----------	Severe: moderately slow permeability in fragipan.	Moderate: moderate bearing capacity.
PrB2----------	Moderate: slope---------	Severe: moderately slow permeability in fragipan.	Severe: high shrink-swell potential.
PrC3----------	Moderate: slope---------	Severe: moderately slow permeability in fragipan.	Severe: high shrink-swell potential.
PrD3----------	Severe: slope----------	Severe: moderately slow permeability in fragipan.	Severe: high shrink-swell potential.
PvE---------- Ratings also apply to Cahaba part.	Severe: slope----------	Severe: slope----------	Severe: slope----------
Rosebloom---------- Mapped only with Arkabutla soils.	Moderate: probable flood damage to embankments.	Severe: subject to flooding; high water table.	Severe: subject to flooding; wetness.
Susquehanna---------- Mapped only with Luverne soils.	Severe: slope----------	Severe: slope----------	Severe: slope----------
Swamp: Sw----------	Severe: underground springs.	Severe: high water table.	Severe: wetness--------
*Vicksburg: Va, Vo---------- For Ochlockonee part of Vo, refer to Ochlockonee series.	Moderate: moderate permeability.	Severe: subject to flooding.	Severe: subject to flooding.

LIMITATIONS FOR SELECTED NONFARM USES--Continued

Roads and streets	Paths and trails	Campsites	Picnic areas	Intensive play areas
Severe: slope-----	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Moderate: moderately slow permeability.
Moderate: moderate traffic-supporting capacity.	Slight----------	Slight----------	Slight----------	Severe: slope.
Moderate: moderate traffic-supporting capacity.	Slight----------	Moderate: slope----	Moderate: slope----	Severe: slope.
Severe: high shrink-swell potential.	Slight----------	Slight----------	Slight----------	Moderate: moderately slow permeability in fragipan.
Severe: high shrink-swell potential.	Slight----------	Slight----------	Slight----------	Severe: slope.
Severe: high shrink-swell potential.	Slight----------	Moderate: slope----	Moderate: slope----	Severe: slope.
Severe: slope-----	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Severe: subject to flooding.	Severe: wetness----	Severe: subject to flooding.	Severe: wetness----	Severe: wetness.
Severe: slope-----	Moderate to severe: slope.	Severe: slope------	Severe: slope------	Severe: slope.
Severe: wetness---	Severe: wetness----	Severe: wetness----	Severe: wetness----	Severe: wetness.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.

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This section tells how the major factors of soil formation have affected the soils in Marshall County and describes how soil horizons develop. It also defines the current system of soil classification.

Factors of Soil Formation

Soil is the product of soil-forming processes acting on accumulated or deposited geologic materials. The five major factors in soil formation are parent material, climate, plants and animals, topography, and time. Climate and living organisms are the active forces of soil formation. Their effect on parent material is modified by relief and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place, but normally all the factors affect the formation of soils.

Parent Material

Parent material is the unconsolidated geologic material in which a soil develops. It largely determines the chemical and mineralogical composition of soils.

Most of the soils in Marshall County formed in Coastal Plain sediments that are overlain by loess. The loess was deposited by water on the flood plains and by wind on the older Coastal Plain formation. It is silt loam or silty clay loam and varies in thickness from 6 feet in the western and northwestern parts of the county to about 2 feet in the eastern part. Because slopes generally are more gentle in the western and northwestern parts of the county, the loess mantle in these areas is thicker.

Soils that formed in place from Coastal Plain sediments occur throughout the county. These sediments consist of sand, silt, and clay laid down by the sea. The soils are loamy to clayey and nearly level to very steep.

Soils that formed in alluvium washed from upland soils occur along the larger streams in the county. They vary in texture according to the texture of the upland soils. Soils on first bottoms have a weakly defined profile because floodwaters still deposit fresh soil material.

Climate

The warm, moist climate in Marshall County has favored the rapid development of soils. Warm temperatures accelerate the growth of many kinds of organisms and the rate of physical and chemical changes in the soils. High precipitation has leached bases and other soluble material and has carried colloidal particles and other less soluble material downward through the profile. For more information about the climate of Marshall County, refer to the section "Climate" at the back of this survey.

Plants and Animals

Micro-organisms, earthworms, plants, and animals that live on and in the soil are important in the formation of soils. Bacteria, fungi, and other micro-organisms help weather rock and decompose organic matter. They are mostly in the uppermost few inches of the soil. Earthworms and other small invertebrates are mostly in the surface layer, where they continually mix the soil material. Plants alter the soil microclimate, supply organic matter, and transfer minerals from the subsoil to the surface layer. Except on the bottom lands, native vegetation in the county was mainly oak, hickory, and pine. On the better drained bottom lands, it was mainly yellow-poplar, sweetgum, ash, oak, and other hardwoods. On the poorly drained bottom lands it was mainly water-tolerant cypress, birch, water tupelo, beach, and oak.

Topography

Topography, or relief, affects soil formation through its influence on drainage, erosion, vegetation, and soil temperature. Slopes in the county range from nearly level to very steep. Differences in slope affect the characteristics of the soils. For example, both Loring and Henry soils formed in thick beds of loess, but the Loring soils are on ridges and the Henry soils are in nearly level areas. The Loring soils are moderately well drained and have a dark-brown subsoil that is underlain by a dark-brown fragipan. In contrast, the Henry soils are poorly drained and have a fluctuating water table, a grayish subsoil, and a strongly developed fragipan.

Time

Generally, a long time is required for the formation of distinct horizons in soils. Young soils commonly have developed very little, and older soils have well-defined horizons. For example, Collins soils are young and have a weakly developed profile. Except for the darkening of the surface layer, they have retained most of the characteristics of the silt loam parent material. Calloway soils are older than the Collins soils and have well-developed horizons. Although they formed in material similar to that of the Collins soils, Calloway soils have a profile quite distinct from the parent material.

Processes of Soil Formation

The main processes involved in the formation of horizons are (1) the accumulation of organic matter, (2) the leaching of calcium carbonates and bases, (3) the formation and translocation of silicate clay, and (4) the reduction, segregation, and transfer of iron.

Accumulation of organic matter in the upper part of the soil profile contributes to the formation of an A1 horizon. The soils in Marshall County have generally low to very low organic-matter content.

Carbonates and bases have been leached from nearly all the soils. Most are moderately to strongly leached. Leaching of bases from the upper horizons of a soil commonly precedes the translocation of silicate clay.

Translocation of silicate clay has occurred in many of the soils. Translocation of clay minerals contributes to the development of an eluviated A2 horizon that contains less clay and is generally lighter in color than the B horizon. The B horizon commonly has clay accumulated in films, in pores, and on the surface of peds. Memphis soils, for example, have films of translocated clay in the B horizon.

Reduction, segregation, and transfer of iron, called gleying, is evident in the poorly drained soils of the county. Reduction and loss of iron is indicated by gray colors in the subsoil. Segregation of iron is indicated by reddish-brown mottles and concretions.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (2) and revised later (8). The system currently used by the National Cooperative Soil Survey was developed in the early sixties (6) and was adopted in 1965 (11). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 8 shows the classification of each soil series of Marshall County by family, subgroup, and order, according to the current system.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions are the Entisols and Histosols, which occur in many different climates.

Four soil orders are represented in Marshall County--Entisols, Inceptisols, Ultisols, and Alfisols. Entisols are recent soils that do not have genetic horizons or have only the beginnings of such horizons. Inceptisols most often occur on young, but not recent, land surfaces. Ultisols have a clay-enriched B horizon that has less than 35 percent base saturation; the base saturation decreases with depth. Alfisols are soils containing clay-enriched B horizons that have high base saturation.

SUBORDER: Each order is divided into suborders, primarily on the basis of those soil characteristics that produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

GREAT GROUP: Each suborder is divided into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated. The features considered are the self-mulching properties of clays, soil temperature, and major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium). The great group is not shown in table 10 because it is the last part of the name of the subgroup.

SUBGROUP: Each great group is divided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Hapludalfs.

TABLE 8.--CLASSIFICATION OF THE SOILS

Series	Family	Subgroup	Order
Arkabutla----	Fine-silty, mixed, acid, thermic----------	Aeric Fluvaquents----------	Entisols.
Bruno--------	Sandy, mixed, thermic----------	Typic Udifluvents----------	Entisols.
Cahaba-------	Fine-loamy, siliceous, thermic----------	Typic Hapludults----------	Ultisols.
Calloway-----	Fine-silty, mixed, thermic----------	Glossaquic Fragiudalfs---------	Alfisols.
Cascilla-----	Fine-silty, mixed, thermic----------	Fluventic Dystrochrepts--------	Inceptisols.
Collins------	Coarse-silty, mixed, acid, thermic--------	Aquic Udifluvents----------	Entisols.
Falaya-------	Coarse-silty, mixed, acid, thermic--------	Aeric Fluvaquents----------	Entisols.
Grenada------	Fine-silty, mixed, thermic----------	Glossic Fragiudalfs----------	Alfisols.
Henry--------	Coarse-silty, mixed, thermic----------	Typic Fragiaqualfs----------	Alfisols.
Lexington----	Fine-silty, mixed, thermic----------	Typic Paleudalfs----------	Alfisols.
Loring-------	Fine-silty, mixed, thermic----------	Typic Fragiudalfs----------	Alfisols.
Luverne------	Clayey, mixed, thermic----------	Typic Hapludults----------	Ultisols.
Memphis------	Fine-silty, mixed, thermic----------	Typic Hapludalfs----------	Alfisols.
Ochlockonee--	Coarse-loamy, siliceous, acid, thermic----	Typic Udifluvents----------	Entisols.
Providence---	Fine-silty, mixed, thermic----------	Typic Fragiudalfs----------	Alfisols.
Rosebloom----	Fine-silty, mixed, acid, thermic----------	Typic Fluvaquents----------	Entisols.
Susquehanna--	Fine, montmorillonitic, thermic----------	Vertic Paleudalfs----------	Alfisols.
Vicksburg----	Coarse-silty, mixed, acid, thermic--------	Typic Udifluvents----------	Entisols.

FAMILIES: Families are established within a subgroup primarily on the basis of properties important to the growth of plants or to the behavior of soils where used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. An example of a family is the Fine-silty, mixed, thermic family of Typic Hapludalfs.

SERIES: As explained in the section "How This Survey Was Made," the series is a group of soils having major horizons that, except, for texture of the surface layer, are similar in important characteristics and in arrangement in the profile. The soil series generally is given the name of the geographic location near the place where a soil of that series was first observed and mapped. An example is the Grenada series.

GEOLOGY AND DRAINAGE

Most of Marshall County is in the north central hills physiographic province. This province is represented by the Wilcox Group and the Claiborne Group of the Eocene Epoch. A strip along the western border is in the Loess Hills province. This province is represented by the Citronelle Formation of the Pliocene Epoch. In many areas these formations were covered with loess during the Pleistocene Epoch. The loess mantle is thickest in the western part of the county and thins out toward the eastern part.

The Wilcox Group consists of the Ackerman Formation and Fearn Springs Sand. The Ackerman Formation is as much as 300 feet thick. It lies unconformably on Fearn Springs Sand, which is about 100 feet thick. Both consist of sand, clay, silt, iron ore, and lignite. The Wilcox Group crops out in the southeastern one-fifth of Marshall County; elsewhere it is overlain by the Claiborne Group.

The Claiborne Group consists of Meridian Sand, the Tallahatta Formation, and Kosciusko Sandstone. Meridian Sand is more than 200 feet thick. It lies unconformably on the Ackerman Formation and Fearn Springs Sand of the Wilcox Group. The Tallahatta Formation consists of sand, white shale, and lignite and is more than 200 feet thick. It lies conformably on the Meridian Sand. Kosciusko Sand consists of sand and sandstone and is about 100 feet thick. It lies unconformably on the Tallahatta Formation and Meridian Sand.

The Citronelle Formation consists of sand and gravel. It occurs in a strip a few miles wide in the extreme western and northwestern part of the county.

Most of Marshall County is drained by the Tallahatchie and Coldwater Rivers, which are tributaries of the Yazoo River. About 70 square miles in the northeastern corner of the county is drained by small streams and creeks that are tributaries of the Wolf River in Tennessee.

The Tallahatchie River drains about one-half of the county. Its tributaries are the Tippah River, and Big Spring, Little Spring, Chewalla, Ochewalla, and Blackwater Creeks. The Coldwater River drains about one-fourth of the county. Its tributaries are Pigeon Roost, Red Banks, and Byhalia Creeks.

CLIMATE [6/]

The climate of Marshall County is subtropical and generally uniform throughout the county. Local variations caused by differences in topography are slight. Table 9 gives data on temperature and precipitation in the county.

In summer, prevailing winds are from the south and the weather is hot and humid. Occasionally, winds that blow from the west and north bring hot dry weather. When prolonged, this dry weather may cause drought of varying severity. Widespread severe drought occurred in 1924 and 1952.

In winter, the county is subject alternately to moist warm air from the south and cold dry air from the north. The change from one to the other sometimes causes rather large and sudden changes in temperature. However, cold spells are usually short.

The temperature is 32° F. or lower about 58 days every year and 90° or higher 73 days. From May through October the temperature is 90° or higher 11 percent of the time and 80° or higher 31 percent of the time. From November through April the temperature is 70° or higher about 7 percent of the time and below 50° about 30 percent of the time.

The freeze-free season, or the period between the last freeze in spring and the first in fall, is about 219 days. The chance is 50 percent that a temperature of 32° or lower will occur after March 29 or before November 4; it is 20 percent after April 8 or before October 23. A temperature of 20° or lower occurs at least once in 9 out of 10 years.

Generally, winter and spring are wet and summer and fall are dry. Fall is the driest season. This is beneficial for farming because harvesting generally is not interrupted by wet weather. In summer, rainfall generally is sufficient for good growth of most crops, and heavy rains in winter provide adequate moisture for crops planted in spring. Measurable amounts of snow fall at least once in 3 out of 4 years.

A tornado occurs in some part of the county once in about 10 years, a severe thundersquall once in about 3 years, and a damaging hailstorm once in about 8 years. A tropical storm or hurricane that damages property or crops occurs about once in 25 years.

Relative humidity is 60 percent or higher 66 percent of the time and less than 40 percent 9 percent of the time. When the temperature is 90° or higher, the relative humidity ranges between 50 and 79 percent 30 percent of the time. Even at low temperatures, the relative humidity is high. When the temperature is 50° or less, the relative humidity is 50 to 79 percent 53 percent of the time and 80 to 100 percent 37 percent of the time.

6/ Prepared by the State climatologist, National Weather Service.

TABLE 9.--TEMPERATURE AND PRECIPITATION

(Holly Springs, Elevation 495 feet)

Month	Temperature 1/			Precipitation 2/			
	Average	Record high	Record low	Average	Record low (1910)	Record high (1957)	Average snowfall
	°F.	°F.	°F.	In.	In.	In.	In.
January	43.2	80	-9	7.03	5.14	8.32	2.4
February	45.0	81	-9	5.30	4.57	8.86	1.0
March	52.6	87	10	6.30	.42	2.68	.1
April	61.7	93	26	4.27	4.91	6.50	0
May	70.0	100	35	3.64	4.74	5.84	0
June	78.2	107	45	3.88	3.47	4.92	0
July	80.8	115	49	4.59	3.24	7.07	0
August	80.4	106	46	3.26	2.64	1.70	0
September	73.9	110	34	3.96	1.05	6.16	0
October	64.0	100	23	2.99	2.42	3.73	0
November	51.4	84	6	4.94	2.25	9.82	0
December	44.3	80	0	5.32	3.57	4.61	.6
Year	62.1	115	-9	55.48	34.42	70.21	4.4

1/ Average temperature based on a 21-year record through 1952; record high and low temperatures based on a 67-year record through 1958.

2/ Average precipitation and snowfall based on a 21-year record through 1952; record high and low temperatures based on a 67-year record through 1958.

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GLOSSARY

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Claypan. A compact, slowly permeable soil horizon that contains more clay than the horizon above and below it. A claypan is commonly hard when dry and plastic or stiff when wet.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are--

Loose.--Noncoherent when dry or moist; does not hold together in a mass.

Friable.--When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.--When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.--When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.--When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.--When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.--When dry, breaks into powder or individual grains under very slight pressure.

Cemented.--Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rains. The distinction between gully and rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by normal tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. V-shaped gullies result if the material is more difficult to erode with depth; whereas U-shaped gullies result if the lower material is more easily eroded than that above it.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.--The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.--The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.--The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.--The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.--Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Leaching, soil. The removal of soluble materials from soils or other material by percolating water.

Loess. Fine-grained material, dominantly of silt-sized particles, that has been deposited by wind.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance--few, common, and many; size--fine, medium, and coarse; and contrast--faint, distinct, and prominent. The size measurements are these: fine, less than 5 millimeters (about 0.2 inch) in diameter

along the greatest dimension; medium, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables--hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Permanent pasture. Pasture that is on the soil for a long time, in contrast to rotation pasture, which is on the soil for only 1 or 2 years because it is grown in rotation with other crops.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runofff.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Site index. A numerical means of expressing the quality of a forest site that is based on the height of the dominant stand at a arbitrarily chosen age; for example, the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years.

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: Very coarse sand (2.0 to 1.0 millimeter); coarse sand (1.0 to 0.5 millimeter); medium sand (0.5 to 0.25 millimeter); fine sand (0.25 to 0.10 millimeter); very fine sand (0.10 to 0.05 millimeter); silt (0.05 to 0.002 millimeter); and clay (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are--platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are (1) single grain (each grain by itself, as in dune sand) or (2) massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically the part of the soil below the solum.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which it belongs. The suitability of the soils for crops is discussed under the heading "Management of the Soils for Crops and Pasture" and in the soil descriptions. The capability classification system is described on pages 28 through 30. Management of the soils for woodland is discussed on pages 33 through 38, and for wildlife, on page 39. Other information is given in tables as follows:

Acreage and extent, table 1, p. 6.
Estimated yields, table 2, p. 30.

Engineering uses of soils, tables 4, 5, and 6, pp. 42 through 53.

MEDIUM INTENSITY SURVEY

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
			Symbol	Number
Au	Arkabutla silt loam	7	IIw-1	1w8
CaE	Cahaba and Lexington soils, 12 to 30 percent slopes	8	VIIe-1	3r7
CbE3	Cahaba-Providence complex, 12 to 30 percent slopes, severely eroded	9	VIIe-2	3r2
CcA	Calloway silt loam, 0 to 2 percent slopes	10	IIIw-1	2w8
CcB2	Calloway silt loam, 2 to 5 percent slopes, eroded	10	IIIw-1	2w8
Cm	Cascilla silt loam	11	I-1	1o7
Co	Collins silt loam	12	IIw-1	1o7
Fa	Falaya silt loam	13	IIw-1	1w8
GrA	Grenada silt loam, 0 to 2 percent slopes	14	IIw-2	2o7
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded	14	IIe-2	2o7
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	15	IVe-1	3o2
GuE	Gullied land-Cahaba complex, 5 to 30 percent slopes	15	VIIe-5	---
GvE	Gullied land-Loring complex, 5 to 30 percent slopes	15	VIIe-5	---
He	Henry silt loam	16	IVw-1	3w9
LeB2	Lexington silt loam, 2 to 5 percent slopes, eroded	17	IIe-1	2o7
LeC3	Lexington silt loam, 5 to 8 percent slopes, severely eroded	17	IVe-1	3o2
LeD3	Lexington silt loam, 8 to 12 percent slopes, severely eroded	17	VIe-1	3o2
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	18	IIe-2	2o7
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded	18	IVe-1	3o2
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded	18	VIe-1	3o2
LuE3	Luverne complex, 12 to 30 percent slopes, severely eroded	19	VIIe-3	4c2
LvE3	Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded	20	VIIe-3	4c2
MeA	Memphis silt loam, 0 to 2 percent slopes	21	I-2	1o7
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	21	IIe-1	1o7
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded	21	IIIe-1	3o2
Oc	Ochlockonee sandy loam	22	I-1	1o7
PoB2	Providence silt loam, 2 to 5 percent slopes, eroded	23	IIe-2	2o7
PoC3	Providence silt loam, 5 to 8 percent slopes, severely eroded	23	IVe-1	3o2
PoD3	Providence silt loam, 8 to 12 percent slopes, severely eroded	23	VIe-1	3o2
PrB2	Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	23	IIe-2	2o7
PrC3	Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	24	IVe-1	3o2
PrD3	Providence silt loam, heavy substratum, 8 to 12 percent slopes, severely eroded	24	VIe-1	3o2
PvE	Providence-Cahaba complex, 12 to 30 percent slopes	24	VIIe-1	3r7
Sw	Swamp	26	VIIw-1	---
Va	Vicksburg silt loam	27	I-1	1o7
Vo	Vicksburg and Ochlockonee soils	27	I-1	1o7

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GUIDE TO MAPPING UNITS--Continued

LOW INTENSITY SURVEY

[The composition of these units is more variable than that of the others in the county, but has been controlled well enough to interpret for the expected use of the soils]

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
			Symbol	Number
AR	Arkabutla-Rosebloom association	7	------	---
	Arkabutla silt loam	--	IVw-2	1w9
	Rosebloom silt loam	--	IVw-2	2w9
CLF	Cahaba-Lexington association, hilly	9	VIIe-1	3r7
CN	Collins-Arkabutla-Bruno association	12	------	---
	Collins silt loam	--	IVw-2	1w8
	Arkabutla silt loam	--	IVw-2	1w9
	Bruno sandy loam	--	IVw-2	2s5
CR	Collins-Arkabutla-Falaya association	12	------	---
	Collins silt loam	--	IVw-2	1w8
	Arkabutla silt loam	--	IVw-2	1w9
	Falaya silt loam	--	IVw-2	1w9
LSF	Luverne-Susquehanna association, hilly	20	VIIe-4	4c2
PCF	Providence-Cahaba association, hilly	25	VIIe-1	3r7

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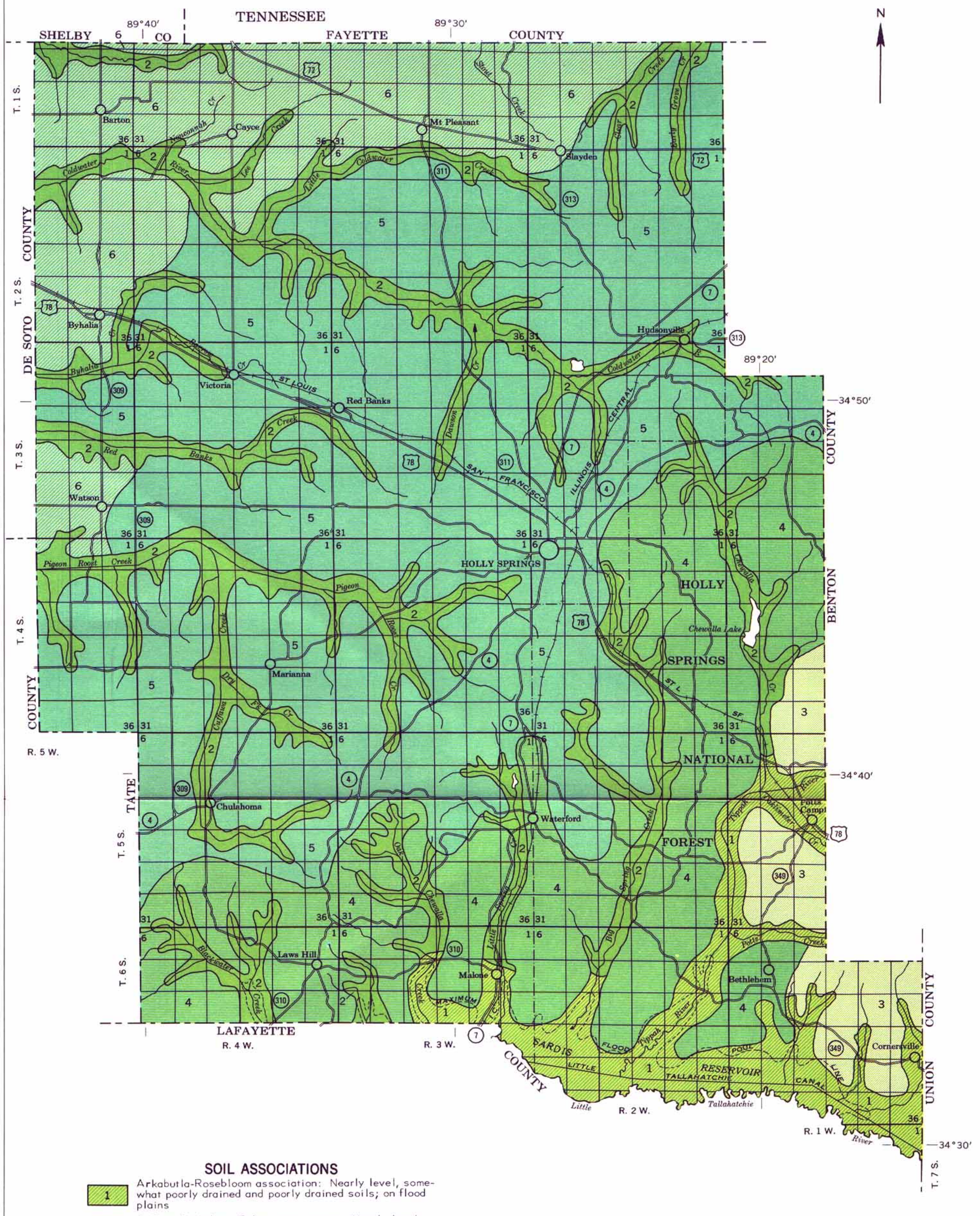

SOIL ASSOCIATIONS

1. Arkabutla-Rosebloom association: Nearly level, somewhat poorly drained and poorly drained soils; on flood plains
2. Collins-Vicksburg-Falaya association: Nearly level, well-drained to somewhat poorly drained soils; on flood plains
3. Luverne-Susquehanna association: Moderately steep, well-drained and somewhat poorly drained soils; on narrow ridgetops and side slopes
4. Gullied land-Cahaba-Lexington association: Gullied land and gently sloping to steep, well-drained soils; on ridgetops and side slopes
5. Loring-Gullied land association: Gullied land and gently sloping to moderately steep, moderately well drained soils that have a fragipan; on ridgetops and side slopes
6. Loring-Grenada association: Nearly level to sloping, moderately well drained soils that have a fragipan; on broad ridgetops

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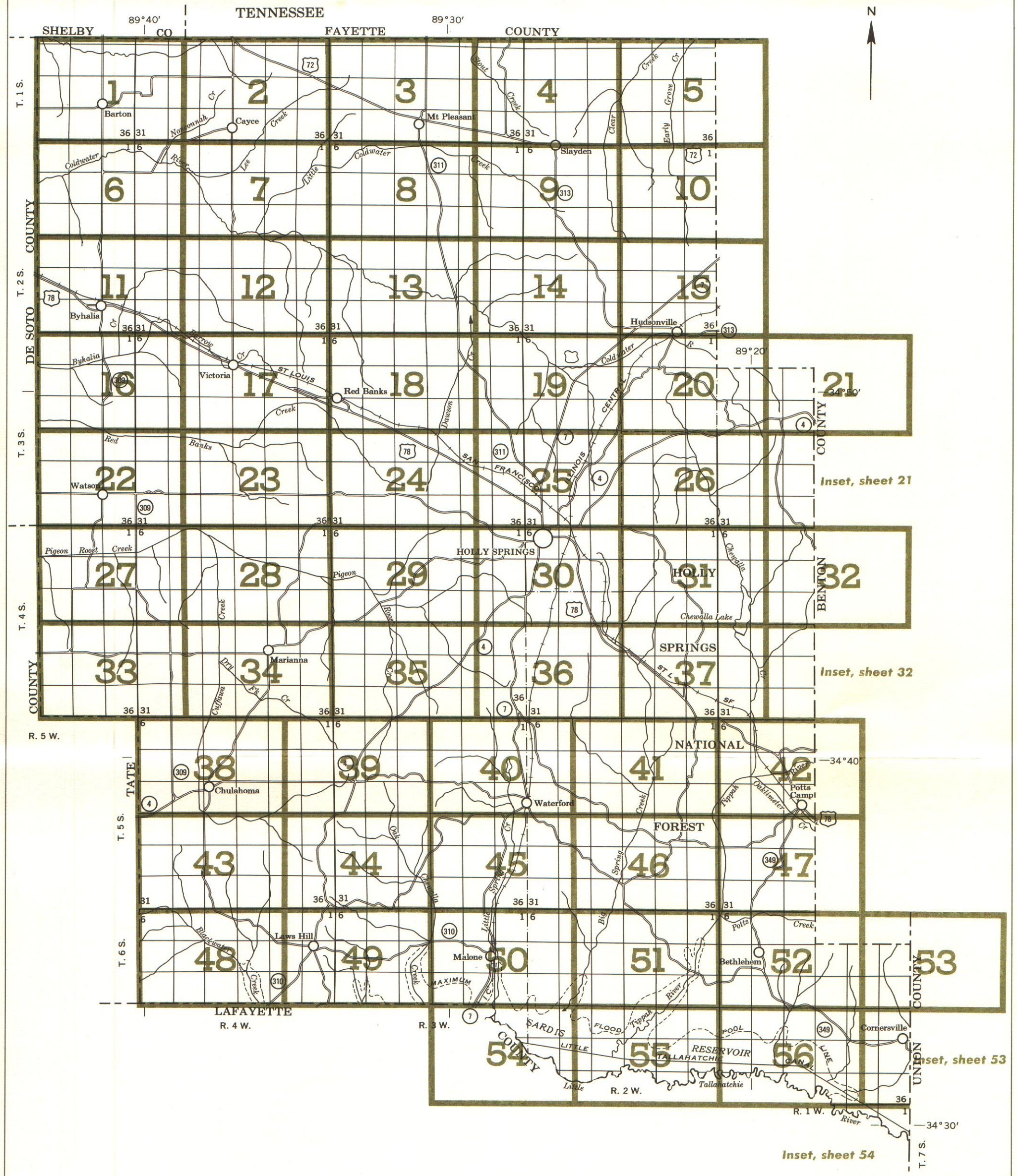
U. S. DEPARMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE AND FOREST SERVICE
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

MARSHALL COUNTY, MISSISSIPPI

1 0 1 2 3 4 Miles

This map is for general planning. It shows only the major soils and does not contain sufficient detail for operational planning.



INDEX TO MAP SHEETS

MARSHALL COUNTY, MISSISSIPPI

1 0 1 2 3 4 Miles

SOIL LEGEND

The first letter, always a capital, is the initial one of the soil name. The second letter is a capital if the mapping unit is one of the low intensity survey; otherwise it is a small letter. The third capital letter, A, B, C, D, E, or F, shows the slope. Most symbols without a slope letter are those of nearly level soils. A final number, 2 or 3, in the symbol indicates that the soil is eroded or severely eroded

MEDIUM INTENSITY SURVEY

SYMBOL	NAME
Au	Arkabutla silt loam
CaE	Cahaba and Lexington soils, 12 to 30 percent slopes
CbE3	Cahaba-Providence complex, 12 to 30 percent slopes, severely eroded
CcA	Calloway silt loam, 0 to 2 percent slopes
CcB2	Calloway silt loam, 2 to 5 percent slopes, eroded
Cm	Cascilla silt loam
Co	Collins silt loam
Fa	Falaya silt loam
GrA	Grenada silt loam, 0 to 2 percent slopes
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded
GuE	Gullied land-Cahaba complex, 5 to 30 percent slopes
GvE	Gullied land-Loring complex, 5 to 30 percent slopes
He	Henry silt loam
LeB2	Lexington silt loam, 2 to 5 percent slopes, eroded
LeC3	Lexington silt loam, 5 to 8 percent slopes, severely eroded
LeD3	Lexington silt loam, 8 to 12 percent slopes, severely eroded
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded
LuE3	Luverne complex, 12 to 30 percent slopes, severely eroded
LvE3	Luverne and Susquehanna soils, 12 to 30 percent slopes, severely eroded
MeA	Memphis silt loam, 0 to 2 percent slopes
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded
Oc	Ochlockonee sandy loam
PoB2	Providence silt loam, 2 to 5 percent slopes, eroded
PoC3	Providence silt loam, 5 to 8 percent slopes, severely eroded
PoD3	Providence silt loam, 8 to 12 percent slopes, severely eroded
PrB2	Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded
PrC3	Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded
PrD3	Providence silt loam, heavy substratum, 8 to 12 percent slopes, severely eroded
PvE	Providence-Cahaba complex, 12 to 30 percent slopes
Sw	Swamp
Va	Vicksburg silt loam
Vo	Vicksburg and Ochlockonee soils

LOW INTENSITY SURVEY 1/

SYMBOL	NAME
AR	Arkabutla-Rosebloom association
CLF	Cahaba-Lexington association, hilly
CN	Collins-Arkabutla-Bruno association
CR	Collins-Arkabutla-Falaya association
LSF	Luverne-Susquehanna association, hilly
PCF	Providence-Cahaba association, hilly

1/ The composition of these units is more variable than that of the others in the county, but has been controlled well enough to interpret for the expected use of the soils concerned.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Tunnel

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

BOUNDARIES

- National or state
- County
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

RELIEF

Escarpments
- Bedrock
- Other

Prominent peak

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness
  - Stony
  - Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

SARDIS RESERVOIR

Sardis Reservoir is a major flood control reservoir located within the county and along its southern boundary. Reservoir area subject to periodic flood control inundation is overprinted with black fine-diagonal lines. The flood control maximum pool shoreline is shown as a black dashed line, delineated at elevation 282 feet. The normal pool shoreline, elevation 235 feet, does not extend into the county.

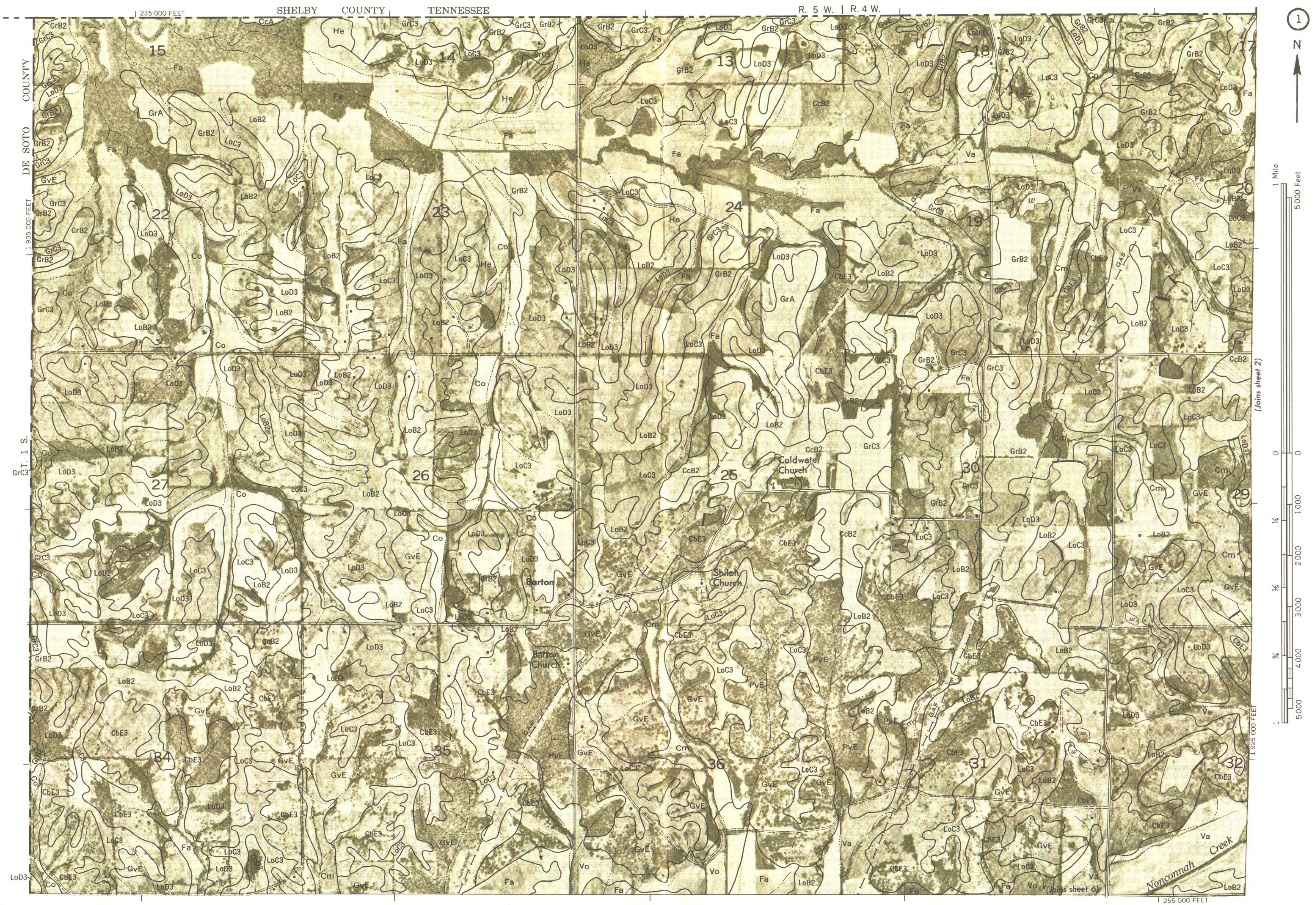
Soil map constructed 1970 by Cartographic Division, Soil Conservation Service, USDA, from 1968 aerial photographs. Controlled mosaic based on Mississippi plane coordinate system, east zone, transverse Mercator projection, 1927 North American datum.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, ...
Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 1

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 1

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.



MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 2

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 2

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 3

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 3

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 4

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 4

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, [illegible]

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 5

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 5

1 350 000 FEET

1 925 000 FEET

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

N

5

6

N

(Joins sheet 1)

R. 5 W. | R. 4 W.

255 000 FEET

1 920 000 FEET

T. 2 S.

1 910 000 FEET

235 000 FEET (Joins sheet 11)

(Joins sheet 7)

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

DE SOTO COUNTY

Coldwater River

Nonconnah Creek

COLDWATER RIVER

GAS

GRAVEL PIT

New Hardy Church

water

w

CR Fa Va Vo Co He

LoB2 LoC3 LoD3 CcA CcB2 CbE3 GrB2 GrC3 GvE PvE Cm GAs

1 2 3 5 6 7 8 10 11 12 13 14 15 17 18

MARSHALL COUNTY, MISSISSIPPI NO. 6

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.
Land division corners are approximately positioned on this map.

N

(Joins sheet 3)

R. 3 W.

300 000 FEET

1 920 000 FEET

T. 2 S.

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 13)

285 000 FEET

1 910 000 FEET

Taska

Coldwater Creek

Little Coldwater Creek

1 Mile 5000 Feet

0 1000 2000 3000 4000 5000

1/4 1/2 3/4

1

MARSHALL COUNTY, MISSISSIPPI NO. 8

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 9

9

N

R. 3 W. | R. 2 W.

305 000 FEET

1 920 000 FEET

T. 2 S.

(Joins sheet 4)

(Joins sheet 10)

(Joins sheet 8)

(Joins sheet 14)

325 000 FEET

1 910 000 FEET

Slayden

Little Coldwater Creek

Clear Creek

1 Mile

5000 Feet

0 0

1 5000 4000 3000 2000 1000

¾ ¾ ½ ¼

MARSHALL COUNTY, MISSISSIPPI NO. 9

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station. Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 10

MARSHALL COUNTY, MISSISSIPPI NO. 10

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 11

11

N

R. 5 W. | R. 4 W.

235 000 FEET

1 905 000 FEET

(Joins sheet 6)

T. 2 S.

DE SOTO COUNTY

MARSHALL COUNTY, MISSISSIPPI NO. 11

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Hearn Grove Church

Byhalia

Byhalia Creek

SAN FRANCISCO ST LOUIS

CREEK

(Joins sheet 12)

(Joins sheet 16)

1 895 000 FEET

255 000 FEET

1 Mile

5000 Feet

Scale 1:20000

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 12

(12)

N

(Joins sheet 7)

R. 4 W.

280 000 FEET

1 905 000 FEET

T. 2 S.

(Joins sheet 11)

(Joins sheet 13)

1 Mile

5 000 Feet

Scale · 1 : 20000

1 895 000 FEET

(Joins sheet 17)

260 000 FEET

Coldwater River

Newest Church

Byhalia Creek

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 12

MARSHALL COUNTY, MISSISSIPPI NO. 13

This map is one of a set compiled in 1970 by the United States Department of Agriculture Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

(Joins sheet 12)
(Joins sheet 8)
(Joins sheet 14)
(Joins sheet 18)

1 285 000 FEET
1 905 000 FEET
1 300 000 FEET
1 890 000 FEET

R. 3 W.
T. 2 S.

Coldwater River
Coldwater River
Dawson Creek

19 20 21 22 23
30 29 28 27 26
31 32 33 34 35

N

1 Mile
5000 Feet
0 0
1/4 1000
1/2 2000
3/4 3000
1 4000
5000

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 14

(14)

N

(Joins sheet 9)

R. 3 W. | R. 2 W.

325 000 FEET

1 905 000 FEET

T. 2 S.

(Joins sheet 13)

(Joins sheet 15)

1 890 000 FEET

305 000 FEET

(Joins sheet 19)

1 Mile 5000 Feet 0 0 1000 2000 3000 4000 5000

MARSHALL COUNTY, MISSISSIPPI NO. 14

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

330 000 FEET (Joins sheet 10)

R. 2 W.

1 905 000 FEET

T. 2 S.

(Joins sheet 14)

(Joins sheet 20)

350 000 FEET

1 890 000 FEET

BENTON COUNTY

Kimbrough Chapel

Hudsonville

Coldwater River

CENTRAL ILLINOIS

N

1 Mile

5000 Feet

1 5000 4000 3000 2000 1000 0

¾ ¼

½

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 15

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 16

16

N

(Joins sheet 11)

R. 5 W. | R. 4 W.

255 000 FEET

1 890 000 FEET

T. 3 S.

DE SOTO COUNTY

1 875 000 FEET

235 000 FEET (Joins sheet 22)

(Joins sheet 17)

BARROW CR

BYHALIA CREEK

BARROW CREEK

RED BANKS CREEK

Warsaw

1 Mile

5000 Feet

0 0

¼ 1000

½ 2000

¾ 3000

4000

1 5000

MARSHALL COUNTY, MISSISSIPPI NO. 16

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 17

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

R. 3 W.

T. 3 S.

300 000 FEET

1 885 000 FEET

1 875 000 FEET

285 000 FEET

1 Mile

5000 Feet

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

1¼ 5 000

(Joins sheet 13)

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 24)

New Hope Church

Red Banks

Pleasant Grove Church

Red Banks Creek

Dawson Creek

ST LOUIS SAN FRANCISCO

78

311

MARSHALL COUNTY, MISSISSIPPI NO. 18

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs, 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 19

20

N

1 Mile

5000 Feet

0 0

(Joins sheet 19)

(Joins sheet 15)

R. 2 W. R. 1 W.

350 000 FEET

1 885 000 FEET

T. 3 S.

BENTON COUNTY

Coldwater River

Chewalla Creek

CENTRAL RAILROAD

ILLINOIS

GRAYS CEMETERY

SYLVESTRIA CEMETERY

Grays Chapel

HOLLY SPRINGS

NATIONAL FOREST

NATIONAL FOREST BOUNDARY

1 875 000 FEET

330 000 FEET

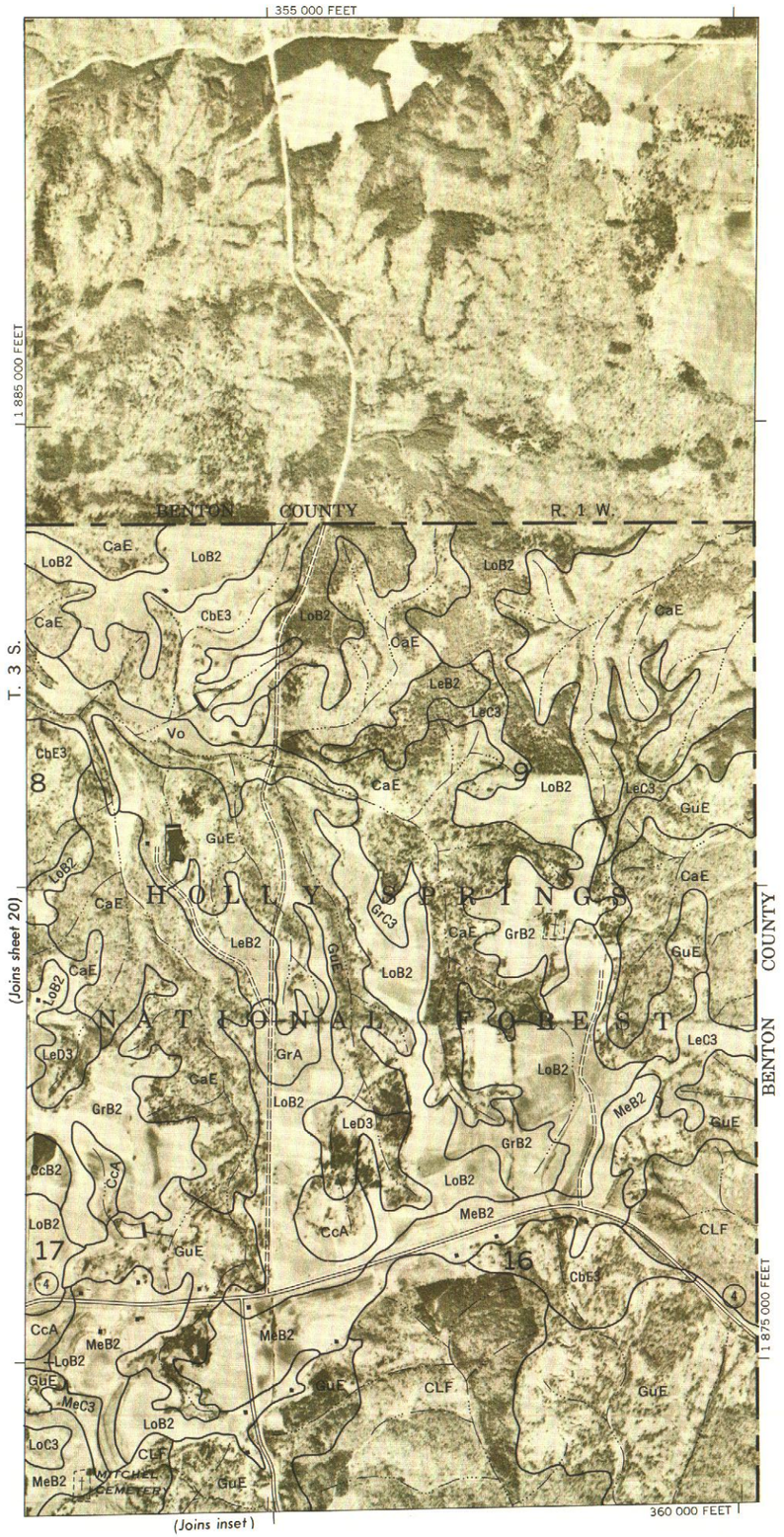
(Joins sheet 26)

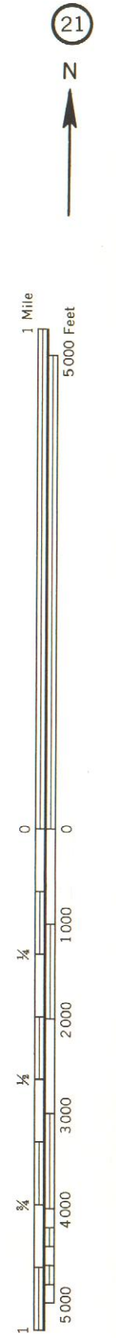
(Joins sheet 21)

MARSHALL COUNTY, MISSISSIPPI NO. 20

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.





Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 21

22

N

(Joins sheet 16)

R. 5 W. | R. 4 W.

255 000 FEET

1 870 000 FEET

T. 3 S.

COUNTY

DE SOTO

RED BANKS CREEK

Emery Church

Watson

(309)

1 Mile

5 000 Feet

0 1000 2000 3000 4000 5000

1 860 000 FEET

235 000 FEET

(Joins sheet 27)

(Joins sheet 23)

MARSHALL COUNTY, MISSISSIPPI NO. 22

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 23

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

(Joins sheet 18)

R. 3 W.

3 000 000 FEET

1 870 000 FEET

T. 3 S.

(Joins sheet 23)

(Joins sheet 25)

1 860 000 FEET

285 000 FEET

(Joins sheet 29)

Red Banks Creek

Mahon Creek

Hebron Church

ST. LOUIS - SAN FRANCISCO

Hudson

19 20 21 22 23 26 27 28 29 30 31 32 33 34 35

1 Mile

5000 Feet

0 0

1/4 1000

1/2 2000

3/4 3000

4/4 4000

5000

1

MARSHALL COUNTY, MISSISSIPPI NO. 24

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 25

25

N

1 Mile

5000 Feet

0 1 5000 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

1 860 000 FEET

FOR BDY NAT

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 25

Land division corners are approximately positioned on this map.

Department of Agriculture, Soil Conservation Service, U.S. Forest Service and the Mississippi Agricultural Experiment Station.

N

1 Mile 5 000 Feet

0 ¼ ½ ¾ 1

1000 2000 3000 4000 5000

(Joins sheet 20)

R. 2 W. | R. 1 W.

350 000 FEET

1 870 000 FEET

T. 3 S.

1 860 000 FEET

330 000 FEET

(Joins sheet 25)

(Joins sheet 21)

(Joins sheet 31)

HOLLY SPRINGS NATIONAL FOREST

22 23 24 19 20 27 26 25 30 29 34 35 36 31 32

Chewalla Creek

MARSHALL COUNTY, MISSISSIPPI NO. 26

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 27

235 000 FEET

R. 5 W. | R. 4 W.

(Joins sheet 22)

1 855 000 FEET

T. 4 S.

TATE COUNTY

PIGEON ROOST CREEK

(Joins sheet 28)

1 845 000 FEET

(Joins sheet 33)

255 000 FEET

27

N

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

MARSHALL COUNTY, MISSISSIPPI NO. 28

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 29

29

N

R. 3 W.

285 000 FEET

(Joins sheet 24)

1 855 000 FEET

T. 4 S.

(Joins sheet 30)

(Joins sheet 28)

1 845 000 FEET

300 000 FEET

(Joins sheet 35)

Dowfords Chapel

CLAY PIT

PIGEON ROOST CREEK

NORTH BRANCH MIDDLE BRANCH SOUTH BRANCH

1 Mile

5000 Feet

Scale 1:20000

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 29

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 30

30

N

(Joins sheet 25)

R. 3 W. | R. 2 W.

325 000 FEET

1 Mile

5000 Feet

1 855 000 FEET

T. 4 S.

HOLLY SPRINGS
(county seat)

SEWAGE LAGOON

SEWAGE LAGOON

Substation

NORTH BRANCH PIGEON ROOST CREEK

CENTRAL ILLINOIS

FRISCO

HOLLY SPRINGS NATIONAL FOREST

1 845 000 FEET

305 000 FEET

(Joins sheet 29)

(Joins sheet 31)

(Joins sheet 36)

MARSHALL COUNTY, MISSISSIPPI NO. 30

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
Photobase from 1968 aerial photographs; 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

32

N

1 Mile
5 000 Feet
0 0
¼ 1 000
½ 2 000
¾ 3 000
4 000
1 5 000

(Joins inset, sheet 21)

R. 1 W.

360 000 FEET

1 855 000 FEET

T. 4 S.

BENTON COUNTY

(Joins sheet 31)

HOLLY SPRINGS

NATIONAL FOREST

1 845 000 FEET

(Joins inset)

355 000 FEET

(Joins lower left)

R. 1 W.

360 000 FEET

1 840 000 FEET

T. 4 S.

BENTON COUNTY

(Joins sheet 37)

HOLLY SPRINGS

NATIONAL FOREST

1 830 000 FEET

(Joins sheet 42)

355 000 FEET

MARSHALL COUNTY, MISSISSIPPI NO. 32

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.

N

R. 5 W. | R. 4 W.

235 000 FEET

1 840 000 FEET

1 830 000 FEET

255 000 FEET

T. 4 S.

MARSHALL COUNTY

TATE COUNTY

(Joins sheet 27)

(Joins sheet 34)

(Joins sheet 38)

Wallhill

Orion

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

1/4 1/2 3/4 1

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI NO. 33

Land division corners are approximately positioned on this map.

Department of Agriculture, Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 34

34

N

1 Mile

5000 Feet

0 0 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

(Joins sheet 28)

R. 4 W.

280 000 FEET

1 840 000 FEET

T. 4 S.

(Joins sheet 33)

1 830 000 FEET

260 000 FEET

(Joins sheet 35)

(Joins sheet 38)

(Joins sheet 39)

Marianna

CREEK

CUFFAWA

DRY FORK CREEK

20 21 22 23 24 25 26 27 28 29 32 33 34 35 36

LoD3 LoC3 PoC3 GrC3 LoB2 PoD3 GrB2 CaE CbE3 CcB2 GuE PvE GvE Va Fa Oc Au Vo He

MARSHALL COUNTY, MISSISSIPPI NO. 34

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs, 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

285 000 FEET

R. 3 W.

(Joins sheet 29)

1 840 000 FEET

T. 4 S.

(Joins sheet 34)

(Joins sheet 36)

1 830 000 FEET

(Joins sheet 39)

(Joins sheet 40)

300 000 FEET

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 35

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

(Joins sheet 30) R. 3 W. | R. 2 W. 325 000 FEET

1 840 000 FEET

T. 4 S.

(Joins sheet 35)

1 830 000 FEET

305 000 FEET

(Joins sheet 37)

(Joins sheet 40) | (Joins sheet 41)

1 Mile

5000 Feet

0 0

¼ 1000

½ 2000

¾ 3000

1 4000

5000

Beverly Church

Gilton

Middle Branch Pigeon Roost Creek

Spring Creek

HOLLY SPRINGS NATIONAL FOREST

MARSHALL COUNTY, MISSISSIPPI NO. 36

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

330 000 FEET

1 840 000 FEET

R. 2 W. R. 1 W.

(Joins sheet 31)

T. 4 S.

(Joins sheet 36)

CHEWALLA LAKE

HOLLY SPRINGS NATIONAL FOREST

Waites

Big Spring Creek

Chewalla Creek

St. Louis — San Francisco

GAS

water

(Joins inset, sheet 32)

1 Mile

5000 Feet

1 830 000 FEET

350 000 FEET

LoB2 (Joins sheet 41) (Joins sheet 42)

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 37

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

N

(Joins sheet 33) | (Joins sheet 34)

R. 4 W.

270 000 FEET

1 825 000 FEET

T. 5 S.

COUNTY

TATE

CREEK

CUFFAWA

Chulahoma

Cuffawa Creek

(Joins sheet 39)

1 815 000 FEET

250 000 FEET (Joins sheet 43)

1 Mile 5 000 Feet

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 1¼ 5 000

MARSHALL COUNTY, MISSISSIPPI NO. 38

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 39

39

N

R. 4 W.
(Joins sheet 34)

R. 3 W.
(Joins sheet 35)

275 000 FEET

1 825 000 FEET

T. 5 S.

(Joins sheet 38)

(Joins sheet 40)

(Joins sheet 44)

295 000 FEET

1 815 000 FEET

Galena

Dry Fork

Creek

Jones Creek

Cuffawa Creek

GAP

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 39

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

40

N

1 Mile

5000 Feet

(Joins sheet 35) (Joins sheet 36)

R. 3 W. | R. 2 W.

320 000 FEET

1 825 000 FEET

T. 5 S.

(Joins sheet 39)

(Joins sheet 41)

1 815 000 FEET

(Joins sheet 45)

300 000 FEET

H O L L Y S P R I N G S

W A L D O X E Y S T A T E P A R K

N A T I O N A L F O R E S T

Waterford

Little Spring Creek

GAS

CENTRAL ILLINOIS

water

GuE LoB2 LeD3 MeB2 MeC3 CaE LeC3 CbE3 Va Vo PoD3 LeB2 Sw Cm PoC3 LoC3 PoB2 MeA Oc CN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

MARSHALL COUNTY, MISSISSIPPI NO. 40

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

41

N

325 000 FEET

1 825 000 FEET

R. 2 W.

T. 5 S.

(Joins sheet 36)

(Joins sheet 37)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 46)

340 000 FEET

1 810 000 FEET

HOLLY SPRINGS NATIONAL FOREST

Big Spring Creek

GAS

CLAY PIT

TIPPAH RIVER

1 Mile

5000 Feet

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 41

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 42

(42)

N

1 Mile 5000 Feet

(Joins sheet 37) (Joins inset, sheet 32)

R. 1 W.

365 000 FEET

1 825 000 FEET

T. 5 S.

(Joins sheet 41)

HOLLY SPRINGS NATIONAL FOREST

RIVER

TIPPAH

CHEWALLA CREEK

SAN FRANCISCO

OAKLIMETER CREEK

Chewalla Church

Potts Camp

BENTON COUNTY

1 810 000 FEET

345 000 FEET

(Joins sheet 47)

MARSHALL COUNTY, MISSISSIPPI NO. 42

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 43

43

N

R. 4 W.

250 000 FEET

1 810 000 FEET

T. 5 S.

(Joins sheet 38)

(Joins sheet 44)

(Joins sheet 48)

270 000 FEET

1 795 000 FEET

CUFFAWA CREEK

Blackwater Creek

GAS

CR

1 Mile

5 000 Feet

0 1 5000

¼ 1000

½ 2000

¾ 3000

1 4000

19 20 21 22 23

30 29 28 27 26

31 32 33 34 35

GuE CaE Va PoD3 LoB2 LoC3 CbE3 PoC3 GrB2 GrC3 GvE PvE MeC3 Co Cm Vo Fa

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, U. S. Forest Service and the Mississippi Agricultural Experiment Station. Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 43

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 44

(44)

N

R. 4 W. | R. 3 W.

(Joins sheet 39)

295 000 FEET

1 810 000 FEET

T. 5 S.

(Joins sheet 43)

(Joins sheet 45)

1 795 000 FEET

275 000 FEET (Joins sheet 49)

1 Mile 5000 Feet

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

MARSHALL COUNTY, MISSISSIPPI NO. 44

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

1 Mile
5 000 Feet
0
0
1/4
1/2
3/4
1
1000
2000
3000
4000
5000

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 45

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

46

N

1 Mile 5000 Feet

0 0

¼ 1000

½ 2000

¾ 3000

1 4000

5000

(Joins sheet 41)

R. 2 W.

340 000 FEET

T. 5 S.

1 805 000 FEET

(Joins sheet 45)

(Joins sheet 47)

1 795 000 FEET

325 000 FEET

(Joins sheet 51)

H O L L Y S P R I N G S

N A T I O N A L F O R E S T

Spring Hill Church

Lebanon Church

Big Spring Creek

GAS

TUPPAH RIVER

20 21 22 23 24 25 26 27 28 29 32 33 34 35 36

GuE CaE Vo LeC3 LeB2 CbE3 PoC3 Co LeD3 CN Fa PCF LuE3 LoD3 PoD3 Cm PrD3 AR Va He Au CcB2 PoB2 CcA LoB2

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 46

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 47

47

N

345 000 FEET (Joins sheet 42)

R. 1 W.

1 805 000 FEET

T. 5 S.

(Joins sheet 46)

(Joins sheet 52)

365 000 FEET

1 795 000 FEET

BENTON COUNTY

HOLLY SPRINGS NATIONAL FOREST

Wilborn Tower

TIPPAH RIVER

S.P.

19 20 21 28 29 30 31 32 33

Au CcA CcB2 Cm CrE Fa GrB2 He LeC3 LoD3 LuE3 PcD3 PoB2 PoC3 PoD3 PrB2 PrC3 PrD3 PvE Vo GuE PCF

78 349

1 Mile

5000 Feet

1 0 ¾ ½ ¼ 0 1000 2000 3000 4000 5000

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 47

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 48

48

N

(Joins sheet 43)

R. 4 W.

270 000 FEET

1 790 000 FEET

T. 6 S.

(Joins sheet 49)

1 Mile

5000 Feet

0 0 1000 2000 3000 4000 5000

1 780 000 FEET

TATE COUNTY

250 000 FEET

LAFAYETTE COUNTY

MARSHALL COUNTY, MISSISSIPPI NO. 48

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 49

49

N

R. 4 W. | R. 3 W.

T. 6 S.

275 000 FEET

1 790 000 FEET

(Joins sheet 44)

(Joins sheet 50)

(Joins sheet 48)

LAFAYETTE COUNTY

295 000 FEET

1 780 000 FEET

Laws Hill

SARDIS RESERVOIR

SARDIS RES.

Chickasaw

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

MARSHALL COUNTY, MISSISSIPPI NO. 49

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs, 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone, 1927 North American datum.

50

N

1 Mile

5000 Feet

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5000

R. 3 W. | R. 2 W.

(Joins sheet 45)

320 000 FEET

1 790 000 FEET

T. 6 S.

(Joins sheet 49)

(Joins sheet 51)

1 780 000 FEET

300 000 FEET

LAFAYETTE COUNTY

(Joins sheet 54)

Oak Chewalla Creek

Asberry Church

Malone Spring

HOLLY SPRINGS

NATIONAL FOREST

SARDIS RESERVOIR

Sproggins

CENTRAL RAILROAD OF MISSISSIPPI

SAND PIT

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 50

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 51

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 52

52

N

1 Mile

5 000 Feet

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 47)

R. 1 W.

365 000 FEET

1 790 000 FEET

T. 6 S.

BENTON COUNTY

H O L L Y S P R I N G S

N A T I O N A L F O R E S T

Bethlehem

Creek

Potts

Water

(Joins sheet 51)

1 780 000 FEET

345 000 FEET

(Joins sheet 56)

(Joins sheet 53)

MARSHALL COUNTY, MISSISSIPPI NO. 52

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

Land division corners are approximately positioned on this map.

MARSHALL COUNTY, MISSISSIPPI NO. 53

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

370 000 FEET

1 790 000 FEET

R. 1 W.

BENTON COUNTY

UNION COUNTY

T. 6 S.

HOLLY SPRINGS

NATIONAL FOREST

11 12 13 14

LSF LvE3 Co PrD3 He PrB2

(Joins sheet 52)

(Joins inset)

380 000 FEET

1 780 000 FEET

(Joins lower left)

370 000 FEET

R. 1 W.

1 775 000 FEET

Cornersville

UNION COUNTY

T. 6 S.

HOLLY SPRINGS

NATIONAL FOREST

23 24 26 25 35 36

LSF LvE3 PrC3 PrD3 GuE CcB2 PrB2 PoB2 CcA Co He Fa Cm Au AR

(Joins sheet 56)

1 765 000 FEET

(Joins inset, sheet 54)

375 000 FEET

53

N

1 Mile

5000 Feet

54

MARSHALL COUNTY, MISSISSIPPI — SHEET NUMBER 54

N

1 Mile 5000 Feet

0 0

¼ 1000

½ 2000

¾ 4000

1 5000

R. 3 W. | R. 2 W.

(Joins sheet 50)

320 000 FEET

1 775 000 FEET

T. 6 S.

(Joins sheet 55)

(Joins sheet 56) | (Joins inset sheet 53)

R. 1 W.

375 000 FEET

1 760 000 FEET

1 765 000 FEET

1 756 000 FEET

365 000 FEET

300 000 FEET

4000 AND 5000 – FOOT GRID TICKS

SARDIS RESERVOIR

HOLLY SPRINGS NATIONAL FOREST

LAFAYETTE COUNTY

UNION COUNTY

YALLABUSHA COUNTY

LITTLE TALLAHATCHIE CANAL

TALLAHATCHIE RIVER

Little Coldwater Creek

Coldwater River

Blue Creek

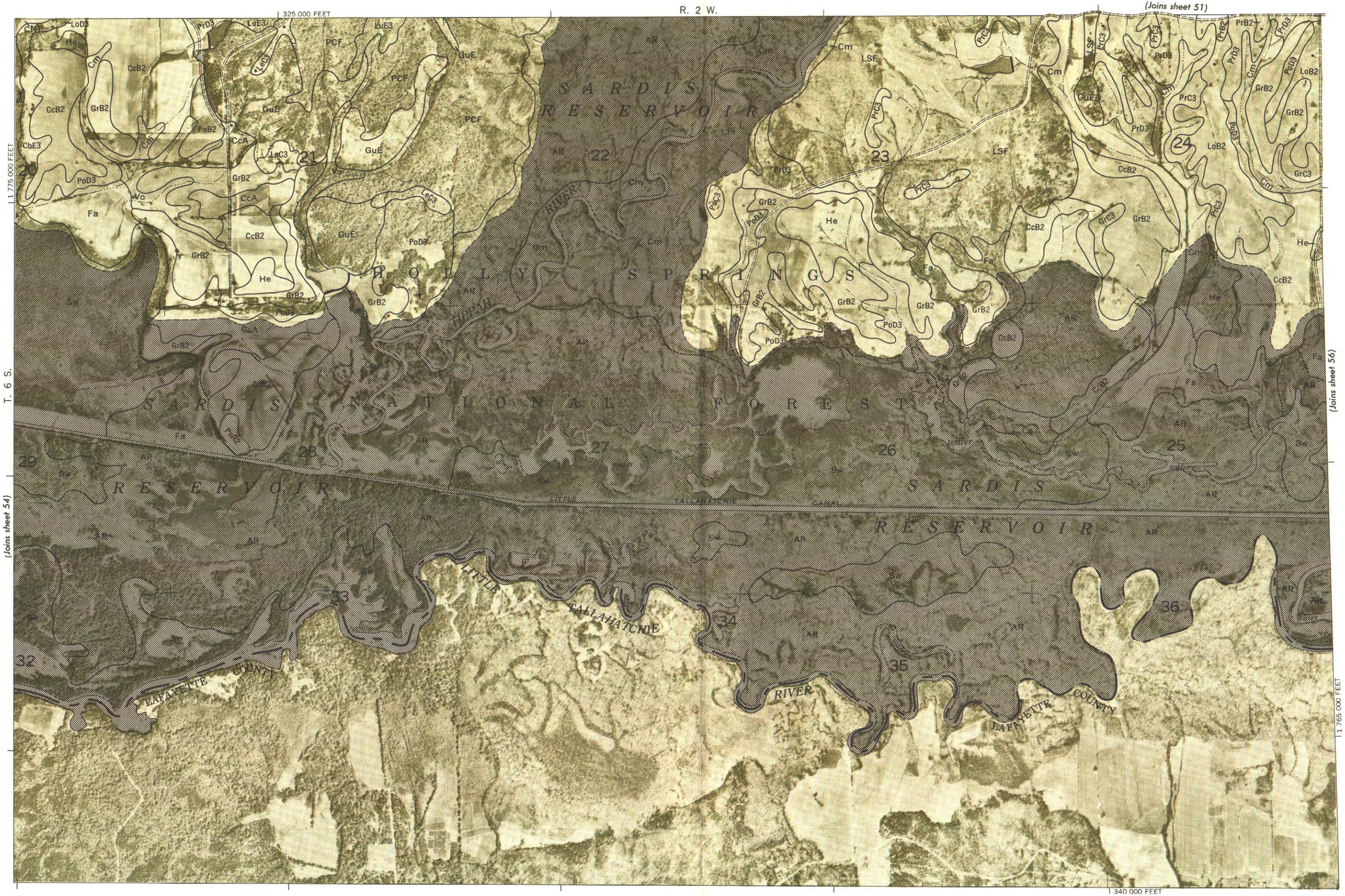
Spring Creek

CcA CcB2 LoB2 CaE GuE Sw Ch Au AR Fa03 P103

MARSHALL COUNTY, MISSISSIPPI NO. 54

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.



55

N

1 Mile

5000 Feet

0

1 000

2 000

3 000

4 000

5000

¼

½

¾

1

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MARSHALL COUNTY, MISSISSIPPI NO. 55

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

56

N

1 Mile

5 000 Feet

0 1/4 1/2 3/4 1

0 1000 2000 3000 4000 5000

(Joins sheet 52)

R. 1 W.

365 000 FEET

1 775 000 FEET

T. 6 S.

(Joins sheet 55)

(Joins inset, sheet 53)

1 765 000 FEET

345 000 FEET

(Joins inset, sheet 54)

SARDIS RESERVOIR

HOLLY SPRINGS NATIONAL FOREST

LITTLE TALLAHATCHIE RIVER

TALLAHATCHIE RIVER

LITTLE TALLAHATCHIE CANAL

LAFAYETTE COUNTY

19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

PrD3 LoB2 PrC3 LoC3 CcB2 GrC3 GrB2 PrB2 LvE3 LSF Cm Fa He Co GuE Vo Au Sw AR

MARSHALL COUNTY, MISSISSIPPI NO. 56

Land division corners are approximately positioned on this map.

Photobase from 1968 aerial photographs. 5,000-foot grid ticks based on Mississippi plane coordinate system, east zone. 1927 North American datum.

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